

Ivory Soap—This is put out by the Procter and Gamble Company, Cincinnati, which in September 1940 signed a stipulation with the Federal Trade Commission. In this it agreed to desist from representing that any test as to the mildness of "Ivory Soap" as compared with any competitively sold soaps shows that "Ivory Soap" is the purer soap, or otherwise representing that the mildness of a soap is indicative of its purity.

McCollum Nostums—This line of products put out by McCollum Laboratories, Inc., Gardena, Calif., comprises medicinal preparations and so-called food supplements including "Isodent," "Isomar," "Isoveg," "Isolax," "Kelp Tablets," "Breakfast Granules," "Alfalfa Tea and Tablets" and "Garlic Parsley McCollum Tablets." The Federal Trade Commission objected to some of the claims under which they were sold, and in June 1940 the concern promised to discontinue these misrepresentations. Among them were that the products supply to the average diet the mineral or vegetable elements in which such diet is deficient, that "Isodent" is a balanced dentifrice or restores natural color to the teeth, builds firmness of the gum tissues, attacks acid mouth germs or reduces tartar, that "Isomar" is a balanced gland food or combines the most valuable organic minerals from land or sea vegetation, that "Isoveg," a food product, provides a source of many of the more important nutritional factors or that such factors are frequently missing in the average daily menu, that "Kelp Tablets" are rich in vital minerals or that such minerals are necessary to body nutriment, that "Breakfast Granules" are an aid to digestion, that "Alfalfa Tea and Tablets" aid nature in providing a source of natural alkaline nutriment, are a valuable internal supplement to creams or powders or increase liquid secretion, or that "Garlic Parsley McCollum Tablets" are capable of reducing high blood pressure. The concern also agreed to cease representing that clinical investigation has shown that either garlic or parsley will cause a lowering of blood pressure or relieve headaches, dizziness or similar symptoms resulting from functional high blood pressure. It is worth noting that some years ago the state chemists of Virginia analyzed six of the McCollum products, namely "Alfalfa Tea," "Alfalfa Tablets," "Kelp Tablets," "Isoveg," "Isomar" and "Isotone." They reported that all six of these contained the same substances (but in varying percentages), namely phosphoric acid, calcium magnesium, ferric oxide, alumina, manganous oxide, cupric oxide, silica, potash, soda and chlorine.

Milks Emulsion—Advertising this as a competent treatment for constipation or as "Nature's Remedy" or a product which would free the user from constipation for all time, and was endorsed by "thousands of mothers," the Milks Emulsion Company, Terre Haute, Ind. promised the Federal Trade Commission in August 1940 to discontinue these misrepresentations. It also promised to cease using the word "Emulsion" or any letters that simulate emulsion in sound or spelling to designate its preparation as compounded and manufactured prior to May 13, 1940. Over a period of years "Milks Emulsion" has, in numerous instances, been declared to violate the Pure Food and Drugs Act because of false or fraudulent claims appearing in or on its trade packages.

Nature's Laxative—A stipulation concerning the advertising of this product was signed in September 1940 by Richard O. Mills trading as R. Mills and Co., Chicago. In this he promised the Federal Trade Commission to cease representing that the product is mild or soothing or is a cleansing agent for the promotion of intestinal hygiene generally, that it stimulates or tends to stimulate the kidneys or liver, that its use is indicated for the stomach, kidneys or liver, that it is a carminative, tonic or tonic-laxative or is different from other preparations containing the same laxative ingredients. Mills also agreed to cease using such phrases as "Best to Aid Nature" and "The Ideal Laxative" in any manner tending to imply that use of the preparation is indicated for all types of constipation or that it contains laxative principles or ingredients not present in other preparations. He further promised to cease using the phrase "R. Mills and Co. Makers of Nature's Laxative" or other use of the word "Makers" which might convey the impression that he manufactures the product he sells, or owns or operates the plant in which it is made.

Rux Compound and Williams Formula—These are put out by one H. L. Williams, trading as Williams S. L. K. Laboratories, Milwaukee. In a stipulation that he signed in September 1940 Williams promised to cease advertising that the "alkalizing" or "salicylating" effect of "Rux Compound" is different from that of old fashioned or modern salves or liniments, that it is absorbed by the blood stream or "salicylates" the system, that physicians say it is a proved method of relieving rheumatic pain, that it acts on congestion of rheumatic pain or helps flush acids out of the body or kidneys, and other similar representations. Williams also promised to cease representing that his "Williams Formula" will stimulate digestion or act on the whole digestive mechanism, or do more than promote the flow of urine as a mild diuretic, eliminate waste material from the kidneys or help build up the quality of the blood, or that it has any therapeutic value in excess of a laxative for the temporary relief of acute constipation, a bitter stomachic or a very mild and limited diuretic, or that it acts in any other way or to any greater extent on the stomach, bowels or kidneys. Further, Williams promised that he would not make therapeutic claims for any ingredients in either of his preparations when such drugs are not contained therein in quantities recognized by science and the medical profession as sufficient to give significant therapeutic value.

"Strengthening the Eyes"—This book, promoting a system of eye exercises, is put out by the MacFadden Book Company, Inc., New York. In April 1940 the Federal Trade Commission reported that the concern had stipulated that it would cease advertising that the book is based on new facts or that the advice or exercises are new or revolutionary, that by following the advice and exercises a person with weak or defective vision may quickly train any of the muscles of his eyes so as to correct

such defects, that exercise is the only real help in cases of impaired vision, that use of the concern's method will enable one to obtain perfect eyesight either with or without the use of glasses, and that as a result of the use of this method those who have used glasses to overcome the effect of faulty refraction, far or near sightedness, astigmatism, squint eyes, cross eyes, weak, watering eyes, poor vision, eye headache or strain can generally remove these defects and be relieved of the necessity for wearing glasses.

Sweetheart Toilet Soap—This product is sold by the Manhattan Soap Company, Inc., New York, which in March 1940 promised the Federal Trade Commission to discontinue certain misrepresentations. Among these were that research experts or laboratories, in connection with their quality ratings of soaps, have tested all brands of soaps, that beauty experts endorse the use of "Sweetheart Toilet Soap" or that doctors prescribe its use, that use of the soap will cause the skin to become healthy or keep it healthy, or that its use will cause one to become or stay young, or, by use of such terms as "skin diet" or similar words or phrases, that "Sweetheart Toilet Soap" contains anything that will nourish or feed the skin, and that any premium is gold plated, when in fact it is gold electroplated. In an earlier case (April 1937) the same concern, also trading under the name Bristol Soap Co., had signed a stipulation with the Commission that it would discontinue certain misrepresentations, such as the use of the words "Doctor" or "Dr" to imply that its products are made in accordance with the prescription or under direction of a physician, or contain special scientific features resulting from medical advice or service. The company also agreed to cease using the word "medicated" to imply that its products have been treated or impregnated with medicine, or the word "health," to describe soap products so as to imply that they contain ingredients which give the user certain benefits beyond those obtained from using any toilet soap, when these are not the facts.

Tampax—Tampax, Inc., New York, in October 1940 stipulated with the Federal Trade Commission that the firm would "discontinue representations that there is a consensus among gynecologists to the effect that there is no comparison between 'Tampax' and the external sanitary napkin from a hygienic standpoint, that the American Medical Association has examined and accepted 'Tampax' for advertising [presumably referring to a misstatement of the facts in regard to this matter], or that physicians as a group have endorsed the product."

Tangee Theatrical Lipstick—The advertising of this product claimed that it would end "that painted look," that it could not make one look painted and contained no pigment or paint, that it was created at the request of America's most prominent actresses and that as a lipstick it is "permanent." In October 1940 the George W. Luft Company, Long Island City, N. Y., signed a stipulation with the Federal Trade Commission in which it agreed to discontinue these claims. In January 1941 Warwick & Legler, Inc., New York, advertising agency, also signed an identical stipulation on behalf of its client the George W. Luft Company.

The Rule of Life or O-K Calendar—Scientific Instruments, Inc. Chicago put out the birth control device known as "The Rule of Life," advertising it as "a slide rule which calculates accurately the sterile and fertile cycles according to the Ogino-Knaus Rhythm Theory." However, in signing a stipulation with the Federal Trade Commission in February 1940 the concern admitted that according to the weight of reliable medical opinion at present no method of calculating such periods can always be relied on. The company then agreed to cease representing that "The Rule of Life" or "O-K Calendar" or any other device operating on the same theory, provides a method of complete, or any definitely stated percentage of, birth control.

Verard Solution—This is distributed by one Ruth Cecil Arden, trading as the Verard Company, New York, who in March 1940 signed a stipulation with the Federal Trade Commission agreeing "to cease representing that the preparation is of itself a competent treatment or effective remedy for athlete's foot, that any person using such medication will no longer suffer from red or swollen feet or certain other discomforts, that beneficial results may be expected by the user without regard to the stage of the infection, the presence of accompanying factors or the necessary hygienic measures which must attend any type of medication for such conditions."

Wild's Cold Capsules and Wild's Cough Syrup—Herman R. and Robert M. Wild and Harry F. Thompson, trading as the Wild Drug Company, Huntington, W. Va., promote these products. In February 1940 these persons promised the Federal Trade Commission to cease advertising that they manufacture either product, that the cold capsules have a tonic effect or have value in building up body resistance, that they will stop colds or prevent their development, that they will provide relief from colds, unless this is expressly limited to relief of certain symptoms or that all ingredients of the capsules are harmless. They also stipulated that they would cease representing that the cough syrup will prevent the development of colds, that it will relieve bronchial troubles or colds, unless the relief is expressly limited to certain symptoms and that it will stop any cough or afford relief from a cough regardless of its severity.

Zip (Beverage)—This is a carbonated water put out by the Zip Company of Chicago. In August 1940 the Federal Trade Commission announced that the concern had agreed to cease representing that "Zip" is an alkalizing beverage, is a health factor of proved value, keeps one physically fit, is a sure relief for indigestion, corrects any physical condition whatsoever or renews energy. The company also agreed to desist from representations that its beverage helps burn up surplus flesh or adipose, or has any therapeutic properties or any appreciable effect on bodily conditions beyond such degree of refreshment as may properly be attributed to a carbonated water beverage.

Correspondence

NUTRITION

To the Editor:—I wish to take exception of Dr. Clendenen's statements relative to vitamins in *THE JOURNAL*, September 20. As usual the major premise is taken as being correct. He has taken a group of individuals who are factory workers and have an income. However, how about those on relief, who get \$4.80 a week with at least \$2 going for lodging? For \$1.80 you can't get much to eat. This is self evident.

In addition I have seen in hospital experience where doctors would not be able to recognize a simple pellagraderm simply because they are not so minded, yet their statements are taken as being conclusive as not having seen such cases of vitamin deficiency. It must be remembered that the human body can stand a lot; vitamin deficiencies take experimentally in man from three to six months at the earliest to manifest themselves, and most often by laboratory and not by clinical observation. Even extreme diet faddists at some time or other get some food which contains a small amount of the vitamins sufficient to keep them in a marginal state until illness or some extreme stress and strain intervene.

The so-called occurring "neuritis" often will manifest itself early only in a heightened sensitivity to external hot and cold, sensitive skin and tongue and mild finger tingling before any actual pain does occur, which is most rare, even in such a deficiency disease as pernicious anemia. The subject is still wide open for objective observation. However, a systematized criterion as to what constitutes vitamin deficiencies must be established. With the advent of quantitative blood and urine studies together with symptomatology and signs, the whole field will be cleared up within a few years.

My statements are based on private and hospital clinical experience among "relief" patients and lower and middle class patients. As for cereals, those appear to be the last food most persons eat today. Diets of 6 to 8 cups of coffee a day together with 2 to 3 packs of cigarets are not uncommon and are sufficient in themselves to cause anorexia and loss of weight. A total caloric intake of even less than 500 calories is very common, particularly in the lonely person who has a small fixed income.

PHILIP R. TROMMER, M.D., Philadelphia.

PLAGUE

To the Editor:—We have been repeatedly warned that plague infection is spreading eastward from the Pacific Coast (Eskey, C. R., and Hass, V. H.: *Pub. Health Rep.* 54:1467 [Aug. 11] 1939; Hampton, B. C., *ibid.* 55:1143 [June 28] 1940; General Medical News, *THE JOURNAL*, September 13, p. 947). It would seem that more information than exists at present should be at hand before it can be accepted as a fact that the infection is really spreading and before any serious alarm is raised. Infection may indeed seem to be spreading eastward if a research for infected rodents spreads in the same direction. For example, the recent discovery of plague infected rodents in the Dakotas may prompt an extension of investigation eastward into Minnesota and Iowa, and if positive results are obtained in the latter states it would appear that the infection had just arrived there. It would seem that the search for plague infected rodents ought to be conducted in all states simultaneously and repeatedly before conclusions are drawn. Such studies may have been, or perhaps are being made, but they have not come to my attention.

It is obvious that human bubonic plague, supposedly first introduced into California many years ago by human or by rat carriers, may have spread to indigenous species of rodents and

may be actually traveling eastward. But according to Evans and Holdenried (*Proc. Soc. Exptl. Biol. & Med.* 47:63 [May] 1941), migration of rodent hosts of sylvatic plague is not alone responsible for the apparent spread. Dissemination by this means is slow, for the greatest distance traveled by tagged members of one colony of ground squirrels was only 1,300 yards. It is of course possible for infection to be spread at a more rapid rate by birds of prey or by insects. Furthermore, sylvatic plague among wild rodents and classic bubonic rat borne plague are apparently different, but whether they are caused by different types of *Pasteurella pestis* or whether one form changes into another by passage through certain hosts is as yet unknown. It is also possible that sylvatic plague is endemic on this continent wherever wild rodents and insect vectors exist and can be found if sought for.

These problems must be solved before it can be definitely stated that plague is spreading in the United States. Similar uncertainties also pertain to Rocky Mountain spotted fever, typhus fever, undulant fever and tularemia, which also may be endemic wherever the hosts of the respective diseases and vectors for their transmission live.

HOBART A. REIMANN, M.D., Philadelphia.

BRITISH LIBRARIES SUFFER LOSSES

To the Editor:—A new "Aid to Britain" has been established by the Medical Library Association. Letters were sent a few months ago to the medical libraries of England and Scotland asking how much damage had been suffered to their books. The Medical Library Association has offered to restore these losses as far as possible from duplicate books and journals in the American medical libraries.

The British librarians are responding enthusiastically, saying that such an understanding of their difficulties and the desire to cooperate in rehabilitating libraries that have suffered damage through enemy action make the burden easier to bear. Most of the libraries succeeded in moving their books to safer areas before the bombing reached their buildings. However, they have suffered considerable loss of recent journals through sinking of vessels enroute to England. Shipments of November issues of American journals seem to have been particularly unfortunate.

The medical library of the University of Bristol reported on July 24 the loss of the roof of a new wing and further damage by water in a second fire. The departmental library of anatomy was entirely destroyed. Guy's Hospital suffered much damage, but the Wills Medical Library is intact and was functioning on July 25. St. Thomas's Hospital of the Medical School in London reported on August 6 that the building suffered loss of windows and other structural damage but that its volumes had been evacuated.

The great library of the British Medical Association on Tavistock Square in London reported on August 11 a very near miss upsetting the bookstacks in the basement. The building received two further hits, without damage to the library. The Royal College of Surgeons, Lincoln's Inn Fields, London, suffered greatly. Its museum suffered a direct hit in one of the biggest air raids, and the buildings were entirely destroyed. The college offices and the library reading room alone escaped but were badly damaged by water. However, all but current journals had been evacuated, and of the latter many were lost. This letter was dated August 2.

The National Institute for Medical Research reported on July 30 that its library escaped damage except for a few broken windows. The librarian, Miss Ethel Wigmore, was formerly librarian of the Bellevue School of Nursing. She went to England a year ago to work with the British Red

Cross and Order of St. John Hospital Library War Organization. In February she received a provisional appointment for one year at the institute and is now acting librarian. The Royal College of Physicians in London also suffered a direct hit, but its books were saved and are now evacuated. This was reported on August 12.

The London School of Hygiene and Tropical Medicine stated on August 18 that its building was seriously damaged in an air raid but that the library escaped damage except for broken doors and windows. Valuable and irreplaceable volumes were removed to safety.

No structural damage was suffered at the Royal Faculty of Physicians and Surgeons of Glasgow, but at the time of writing, August 7, there was considerable loss of periodicals. The librarian is making an especial appeal for reprints of the more important original contributions to the American medical journals.

The Medical Library Association is an organization of the medical libraries of the United States and Canada, with a few international members. It also has a large supporting membership among librarians and those interested in the work of the association. Through its exchange, medical libraries that are members exchange duplicate books and journals from their own holdings to help build up other libraries of the association. Miss Mary Louise Marshall of Tulane University, New Orleans, is president. Colonel Harold Jones, librarian of the Army Medical Library and editor of the *Association Bulletin*, was president for the last two years.

In response to the British letters, members of the association will accumulate the journals lost in transit to the libraries abroad and send them after the war is over, except to libraries where the journals are now needed, and these will be shipped at once, the chance being taken that they will be delivered. Physicians in all American cities are requested to take current journals that they do not wish to keep to their nearest medical library to assist in this effort to help the British libraries and their readers.

FLORENCE A. COOKSLEY, M.A., Rochester, N. Y.
Librarian, Rochester Academy of Medicine.

HISTORY OF COCAINE AS A LOCAL ANESTHETIC

To the Editor:—In the history of anesthesia, the discovery of the application of cocaine as a local anesthetic by Carl Koller has always seemed to be the one chapter free from acrimoniously disputatious conflict. The following is a letter from Dr. Koller of New York:

My dear Dr. Seelig:

I happened yesterday to read your article in the Howard Lilienthal dedicatory volume on the Progress of Medicine in the Last Hundred Years, and admired its broad sweep and inspired language. Coming to the passage dealing with anesthesia, I could not help being pained by your adopting the incorrect statements, not of Freud himself but of his admirers and hangers-on, that Freud had anything to do with starting cocaine as a local anesthetic in surgery.

Freud has stated the facts correctly in his *Autobiography*, but in such ambiguous language that his enthusiastic admirers claimed for him what was not according to the facts. The facts are that neither Freud nor I discovered that cocaine is a local anesthetic. This was discovered by Dr. Albert Niemann, the assistant of the great chemist Wöhler, who extracted the potent principle from coca leaves in 1860 that Dr. Scherzer brought home with him from Peru which he visited during his globe-encircling voyage on the Austrian frigate *Novara*. After him a whole galaxy of physiologists and pharmacologists made thorough investigations of the drug. Nobody paid a great deal

of attention to the benumbing effects of cocaine on the tongue and lips until the Peruvian army surgeon Moreno y Mayz remarked in 1868 that the sensory paralyzing effects might be put to use in medicine. After him the Baltic surgeon Anrep in 1879 published an excellent article about his work in the laboratory of the Jena pharmacologist Rossbach, in which he made the same remark without doing anything about it.

So matters stood until the spring of 1884, when Freud conceived the idea of curing a friend of morphinism by administering cocaine to him. It was an ill fated idea.

Freud became interested in cocaine and its general physiological effects and, in his ignorance of the vast literature, he conceived some experiments about the effects of the drug on muscular strength and endurance. He never dreamed of anesthesia. He asked me to share in the experiments. We broke off the experiments when Freud went to Hamburg to call on his fiancée.

Before leaving he asked his friend Leopold Koenigstein to try the drug on the "diseased eye" (am kranken Auge). No thought of anesthesia. Koenigstein, a rather dull person, was fascinated by the vasoconstricting powers of cocaine and tried to cure iritis and trachoma with it. When I told him that it was an excellent anesthetic he said that I was mistaken. But that did not prevent him from reading, on the same evening that I read my paper before the *Gesellschaft der Aerzte*, his paper in which he extolled the anesthetic properties of cocaine without saying one word of his having the information from me. That was too much for Freud and Julius von Wagner-Jauregg, and they made him (without any intercession on my part) write a letter to one of the three Vienna medical weeklies in which he acknowledged having no claim to priority regarding the idea of surgical anesthesia. You can find this letter in one of the October (?) numbers of the *Medizinische Presse* (?) of 1884.

Freud in his *Autobiography* regrets the fact that he passed by this great opportunity and gives full credit to me. I find fault with him only in that he failed to call off his overenthusiastic admirers for giving credit to him for what he did not have any right to.

The facts are that Freud did not have anything whatever to do with cocaine anesthesia, nor did he write a single word about work on cocaine in 1885 (whereas my work dates from 1884) that had not been done better and more scientifically by Anrep in 1879. Historical untruths are very difficult to destroy.

CARL KOLLER, M.D., New York.

P. S.—I enclose a reprint (Nachträgliche Bemerkungen über die ersten Anfänge der Lokalanästhesie, *Wien. med. Wchnschr.* (No. 1) 85:7, 1935) of an article which I published purposely in a Viennese medical weekly so that it would surely come under Freud's eye. I thought it might make him come out and disavow the claims of his admirers that he had instigated my work on cocaine as a local anesthetic. However, it had no such effect. I was on friendly terms with Freud and did not wish to accuse him directly of dishonesty. However, his expression in his *Autobiography* "that he had told me also of cocaine" was so ambiguous as to cause all this untrue representation.

You are at liberty to make any use you want to, or no use at all, of my letter.

C. K.

The letter is not only of human interest but also of historical significance.

M. G. SEELIG, M.D., St. Louis.

FIRST SURGERY ON PATENT DUCTUS ARTERIOSUS

To the Editor:—Even at this late date, for the sake of historical accuracy, I call attention to an error on page 1264 of *THE JOURNAL* for Oct. 12, 1940: Dr. Beck states that "John Monro of Boston" in 1907 suggested operation to tie off a patent ductus arteriosus. The surgeon referred to was John C. Munro, surgeon in chief at the Carney Hospital, Boston, not "John Monro."

HENRY A. CHRISTIAN, M.D., Brookline, Mass.

Council on Medical Education and Hospitals

CONTINUATION COURSES FOR PRACTICING PHYSICIANS

For a number of years the Council on Medical Education and Hospitals has collected and published data concerning the various types of continuation courses that have been offered to practicing physicians. Following is a list of the continuation

courses which will be available during the fall quarter of 1941 and it is the intention of the Council to prepare and disseminate similar information at intervals of three months. Such advance notice of graduate courses will be of value to physicians who may be planning to take some postgraduate work but who at present have no convenient means of knowing when and where the subjects in which they are interested will be taught.

WILLIAM D. CUTTER, M.D., Secretary.

The first four pages of this list were published in THE JOURNAL Oct. 4, 1941, beginning on page 1205.—Ed.

Continuation Courses for Practicing Physicians, Fall of 1941—Continued

Institution	Courses Scheduled to Begin	Length and Content of Course	Number of Students Accepted for Each Course	Registration Fee and/or Tuition	For Detailed Information Write to
PATHOLOGY					
Harvard Medical School, Courses for Graduates	Arranged on application	1 month	4	\$40 ¹	Assistant Dean, Harvard Medical School, 25 Shattuck St., Boston
Columbia University College of Physicians and Surgeons	Nov. 3 ²	3 afternoons a week, 3 weeks (pathology of the blood)	3 to 6	\$75	Dean of the School of Medicine, Columbia University, 630 W. 168th St., New York City
Woman's Medical College of Pennsylvania	Sept. 17	8 months course	2	\$100 to \$300	Dean, Woman's Medical College of Pennsylvania, Henry Ave. and Abbottsford Rd., Philadelphia
PEDIATRICS—See also under Obstetrics					
University of California School of Medicine	Dec. 15; Jan. 15	1 and 2 week courses	Limited	\$90 ³	Director of Maternal and Child Health in state health departments of California, Arizona, Nevada, New Mexico, Utah and Idaho
The Children's Memorial Hospital, Chicago	Oct. 13	4 weeks	.....	\$100	Chief of Staff, The Children's Memorial Hospital, 707 Fullerton Ave., Chicago
University of Illinois College of Medicine	Arranged on application	8 lectures, 4 months clinical (child psychology)	.....	Varies ³	Assistant to the Dean, University of Illinois College of Medicine, 1853 W. Polk St., Chicago
Harvard Medical School, Courses for Graduates	October; January	8 months to 1 year	Limited	\$300 to \$600 ¹	Assistant Dean, Harvard Medical School, 25 Shattuck St., Boston
Tufts Medical School, Postgraduate Division	Jan. 5	4 weeks	4	\$50 ¹	Chairman, Postgraduate Division, Tufts Medical School, 30 Bennet St., Boston
Center for Continuation Study, University of Minnesota	Dec. 15	6 days	.....	\$25	Center for Continuation Study, University of Minnesota, Minneapolis
Kings County Hospital, Brooklyn (Joint Committee on Post-Graduate Education)	October	10 sessions on heart disease in childhood	8	\$10	Registrar, Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn
Bellevue Hospital (New York University College of Medicine)	Arranged on application	1 year, full time	.....	\$200 a year	Assistant Dean, New York University College of Medicine, 477 First Ave., New York City
Columbia University College of Physicians and Surgeons	October, monthly	1 month or longer, full time	3 to 12	\$125	Dean of the School of Medicine, Columbia University, 630 W. 168th St., New York City
PERIPHERAL VASCULAR DISEASES					
Newark City Hospital, Newark (New York University College of Med.)	Nov. 12	2 afternoons a week, 4 weeks	6 to 12	\$25	Dean, New York University College of Medicine, 477 First Ave., New York City
Columbia University College of Physicians and Surgeons	Dec. 8	5 days	4 to 10	\$35	Dean of the School of Medicine, Columbia University, 630 W. 168th St., New York City
New York Academy of Medicine.....	Oct. 13	2 weeks (graduate fortnight)	.....	\$5	Executive Secretary, Committee on Medical Education, 2 E. 103d St., New York City
PHYSICAL THERAPY					
New York Polyclinic Medical School and Hospital	Arranged on application	4 weeks or more	.....	\$100	Medical Executive Officer, New York Polyclinic Medical School, 335 W. 50th St., New York City
PNEUMONIA					
State Hygienic Laboratory.....	Fall	3 days (pneumonia typing technic)	.....	None ³	Director, State Hygienic Laboratory, Iowa City
New York University College of Medicine	Arranged on application	4 weeks, full time	4	\$150	Assistant Dean, New York University College of Medicine, 477 First Ave., New York City
PROCTOLOGY					
Harvard Medical School, Courses for Graduates	Nov. 17	6 days	8 or more	\$50 ¹	Assistant Dean, Harvard Medical School, 25 Shattuck St., Boston
Tufts Medical School, Postgraduate Division	Oct. 27	6 days	.....	\$25 ¹	Chairman, Postgraduate Division, Tufts Medical School, 30 Bennet St., Boston
	Nov. 3	2 or 4 weeks, mornings (advanced course)	.....	\$50 to \$100	
New York Polyclinic Medical School and Hospital	Jan. 2	6 weeks	.....	\$75 to \$100	Medical Executive Officer, New York Polyclinic Medical School, 335 W. 50th St., New York City
PUBLIC HEALTH					
Loyola University School of Medicine	Fall	1 or more semesters (various courses)	.....	\$10 to \$125	Dean, Loyola University School of Medicine, 706 S. Wolcott Ave., Chicago
Johns Hopkins University School of Hygiene and Public Health	Nov. 15	8 week quarter (various courses)	.....	\$10 to \$75	Dean, School of Hygiene and Public Health, Johns Hopkins University, 615 N. Wolfe St., Baltimore
Massachusetts Institute of Technology	Sept. 29	2 semesters	.....	\$700 a semester	Admissions Office, Massachusetts Institute of Technology, Cambridge
Albany Medical College.....	Arranged on application	1 year correspondence course, 11 conferences, 2 days in residence	.....	\$29	Director, Extension Course in Public Health, Albany Medical College, New Scotland Ave., Albany
University of North Carolina School of Public Health	Sept. 24	3 or 4 months	.....	\$100	Dean, University of North Carolina School of Public Health, Chapel Hill

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals for Profit: When General Allegations of Negligence Are Sufficient.—The plaintiff brought suit against the Hollywood Hospital and several physicians, alleging that he was a patient in the defendant hospital for about six weeks for the performance of a "kidney operation" and necessary after-care, that sometime during his stay, just when he did not know, his "second floater rib" was broken through the negligence of the defendants and that the defendants failed to render him any care for the broken rib. This failure to treat him for the broken rib, he alleged, was occasioned either by a wilful and wanton refusal to care for him or because the defendants were not aware of the fact that the rib was broken. The trial court sustained general and special demurrers interposed by the hospital to the complaint on the ground that the complaint did not state a cause of action, and the plaintiff appealed to the district court of appeal, second district, division 1, California, which affirmed the judgment of the trial court. *Guilliams v. Hollywood Hospital*, 105 P. (2d) 318. The plaintiff then appealed to the Supreme Court of California, which in the reported decision considered the propriety of the trial court's action only with respect to the liability of the hospital.

The demurrers interposed by the hospital were based apparently on the theory that the complaint was fatally defective because it failed to specify the manner in which the plaintiff's rib was broken or the acts of the hospital which were responsible for the injury. The Supreme Court thought, however, that the general demurrer at least should not have been sustained because a valid cause of action may be stated by alleging negligence in general terms without detailing the specific manner in which the injury occurred. There are, of course, said the Supreme Court, limitations to the generality with which a plaintiff is permitted to state his cause of action. Ordinarily while negligence may be pleaded in general terms, the plaintiff must indicate the acts or omissions which he alleges to have been negligently performed. He may not recover on the bare statement that the defendant's negligence has caused him injury. The defendant contended that the complaint in the instant case failed to state a cause of action because the plaintiff did not specify any acts or omissions but attempted to state merely that he was injured by the defendant's negligence. The hospital argued that such a general allegation exceeds the permissible limits of generality. It should be recognized, answered the Supreme Court, however, that the particularity with which a plaintiff must state his cause of action depends to some extent on the circumstances and the situation of the parties. Even under the strict rules of common law pleading this principle is recognized. As was said by this court in *Stephenson v. Southern Pac. Co.*, 102 Cal. 143, 34 P. 618, 36 P. 407:

In adopting what is known as the "code system of pleading," courts . . . have so far modified the rule as to permit the plaintiff to state the negligence in general terms, without stating the facts constituting such negligence. This modification . . . grows out of a fundamental rule in common-law pleading, to the effect that "no greater particularity is required than the nature of the thing pleaded will conveniently admit" (Steph. Pl. 367) supported by that other rule that "less particularity is required when the facts lie more in the knowledge of the opposite party" ([Steph. Pl.] 370).

In the *Stephenson* case the court further pointed out that the plaintiff frequently may know only the general cause of the injury and may be entirely ignorant as to the specific acts or omissions which led up to it. Under these principles, continued the court, the complaint in this case cannot be held fatally defective. The plaintiff has alleged that the defendant so negligently and carelessly attended to him prior to and during the operation that his rib was broken. He alleges further that the defendant failed to discover the broken rib, which should have been discovered in the exercise of ordinary skill, or that, having discovered it, the defendant negligently failed to render any care or treatment for the broken rib. While

this language is very general, it sets forth acts and omissions of the defendant hospital and classifies both as negligent in character. Either type of negligent conduct is sufficient to support the plaintiff's cause of action. Furthermore, the plaintiff has set forth "what was done" with as much particularity as he can, considering the nature of his cause of action and his condition when the injury is alleged to have occurred. So far as the rules of pleading are concerned, there is no requirement that he identify and allege the precise moment of the injury or the exact nature of the wrongful act. These are matters of evidence, and in situations in which an instrumentality under the defendant's control causes the injury, the plaintiff may be aided in the trial by the doctrine of *res ipsa loquitur*, which requires the defendant to come forward with an explanation. As the plaintiff suggests, the evidence at a trial may show that the attendants dropped him off the carriage while moving him from the operating room, or that they were insufficient in number or inadequately trained to do their work, or that they used defective apparatus furnished by the hospital, or that they ignored his complaints. These matters are mentioned solely to clarify the distinction between the requirements of pleading and of proof. The particularity of the evidence required to sustain the plaintiff's cause of action at the trial is immaterial in considering the sufficiency of the complaint as against a general demurrer. The trial court was in error, therefore, in the opinion of the Supreme Court, to hold that the complaint did not state a cause of action against the defendant hospital.

The hospital next contended that the allegations in the complaint concerning negligent failure to discover the broken rib or wilful failure to render care and treatment therefor cannot state a cause of action because the discovery and treatment of the condition would constitute the practice of medicine by a corporation in violation of the California medical practice act. But, answered the Supreme Court, the allegations of the complaint in this respect cannot be construed as setting forth an agreement whereby the hospital, as a corporation, undertook for a fee to furnish medical diagnosis and treatment. The complaint charges only what is common practice, that the hospital agreed to care for the patient in the usual manner, that is, to furnish him with accommodations and to maintain such attendants, including nurses and interns, as would assure him proper care and attention before, during and after the operation. Under such circumstances it cannot be said that the hospital is practicing medicine in violation of law.

The judgment in favor of the hospital was accordingly reversed and the cause remanded.—*Guilliams v. Hollywood Hospital*, 114 P. (2d) 1 (Calif., 1941).

Society Proceedings

COMING MEETINGS

- American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 19-23. Dr. William P. Wherry, 107 South 17th St., Omaha, Executive Secretary.
- American Clinical and Climatological Association, Skytop, Pa., Oct. 16-18. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.
- American College of Surgeons, Boston, Nov. 3-7. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.
- American Public Health Association, Atlantic City, N. J., Oct. 14-17. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.
- American Society of Tropical Medicine, St. Louis, Nov. 11-14. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
- Associated Anesthetists of the United States and Canada, Boston, Nov. 3-7. Dr. C. J. Wells, 1932 S. Salina St., Syracuse, N. Y., Secretary.
- Association of American Medical Colleges, Richmond, Va., Oct. 27-29. Dr. Fred C. Zappe, 5 South Wabash Ave., Chicago, Secretary.
- Association of Military Surgeons of the United States, Louisville, Ky., Oct. 29-Nov. 1. Colonel James M. Phalen, Army Medical Museum, Washington, D. C., Secretary.
- Central Society for Clinical Research, Chicago, Nov. 7-8. Dr. Carl V. Moore, Washington University School of Medicine, St. Louis, Secretary.
- Inter-State Postgraduate Medical Association of North America, Minneapolis, Oct. 13-17. Dr. Tom B. Throckmorton, 406 Sixth Ave., Des Moines, Iowa, Secretary.
- Omaha Mid-West Clinical Society, Omaha, Oct. 27-31. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha, Secretary.
- Radiological Society of North America, San Francisco, Dec. 1-5. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, New York, Dec. 6. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Southern Medical Association, Ala., Secretary.
- Empire Bldg., Birmingham, Ala., Secretary.
- Western Surgical Association, St. Paul, Dec. 5-6. Dr. Arthur R. Metz, 2449 Washington Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

22:1-140 (July) 1941

- *Syndrome of Painful Disability of Shoulder and Hand Complicating Coronary Occlusion. J. M. Askey, Los Angeles—p. 1
- Physiologic Action of Oxygen and Carbon Dioxide on Coronary Circulation as Shown by Blood Gas and Electrocardiographic Studies. A. L. Barach and A. Steiner, with technical assistance of M. Eckman and N. Molomut, New York—p. 13.
- Duration of Electrical Systole (QT Interval) in Cases of Massive Pericardial Effusion. C.-L. Tung, Peiping, China—p. 35
- Auricular Fibrillation in Normal, Intact Animals After Intravenous Injection of Mecholyl (Acetyl- β -Methylcholine). A. Iglauer, D. Davis and M. D. Altschule, Boston—p. 47.
- *Cor Pulmonale: Observations in Fifty Autopsy Cases. R. W. Scott and C. F. Garvin, Cleveland—p. 56
- Occurrence in Angina Pectoris of Electrocardiographic Changes Similar in Magnitude and in Kind to Those Produced by Myocardial Infarction. F. N. Wilson and F. D. Johnston, Ann Arbor, Mich—p. 64.
- *Lumbar Sympathectomy in Treatment of Selected Cases of Peripheral Arteriosclerotic Disease. L. N. Atlas, Cleveland—p. 75.
- Effect of Diffuse Pericarditis on Electrocardiographic Pattern of Recent Myocardial Infarction. R. Langendorf, Chicago—p. 86
- Frequency of Electrocardiographic Variations in Normal, Unanesthetized Dogs. J. Lalich, L. Cohen and G. Walker, Kansas City, Kan—p. 105.
- Incidence of Rheumatic and Congenital Heart Disease Among School Children of Louisville, Ky. M. M. Weiss, Louisville, Ky—p. 112.
- Observations on Production of Myocardial Disease with Acetylcholine. R. G. Horswell, Boston—p. 116.
- Deproteinized Pancreatic Extract (Depiopanex). II Effect of Intravenous Administration in Rabbits. M. S. Schwartz, M. M. Fisher, I. S. Wright and A. W. Duryee, New York—p. 122
- Comparison of Leads 4 R and 4 F. I. M. Liebow and E. H. Cushing, Cleveland—p. 125.

Disability of Shoulder and Hand in Coronary Occlusion.—Askey describes a syndrome of painful disability of the shoulder and hand which persists from several months to two years after coronary occlusion. It seems to be precipitated by coronary occlusion, as only 6 of 18 patients had had any previous pain of the upper extremity and in them the pain was definitely increased by the cardiac attack. The author feels that the syndrome is not a rare sequela of coronary occlusion. He does not refer to the pain of the left arm and hand after a paroxysm of angina pectoris but to a persistent, painful disability which restricts movement of the shoulder and causes swelling of the fingers. He has encountered 22 patients with this syndrome. The diagnosis of coronary occlusion was made in 18 and confirmed by an electrocardiogram in 15. In the other 4 there was a long-standing diagnosis of angina pectoris. In these 4 there had been an unusually severe attack prior to the development of the syndrome, and an unrecognized occlusion may have occurred. Several of the 18 had had repeated occlusions. The sequence of events seemed to be myocardial ischemia, cardiac pain, shoulder pain and, later, hand pain. The hand disability, although it persisted in many cases for two years, was not characteristic of long-standing rheumatoid arthritis or osteoarthritis. The muscle atrophy of the one and the Heberden's nodes of the other were absent, and the condition of the hands gradually improved rather than becoming worse. The shoulder pain was similar to that of peri-arthritis. An accompanying cervical neuralgia was suggested in the author's cases by the apparent sensitization of cervical plexus nerves and by the relief that some of the patients obtained from pressure. He believes that the difference in the syndromes, after coronary occlusion, of shoulder pain without restricted movement, shoulder pain with restricted movement and shoulder pain and hand involvement is probably one of degree and probably depends on the intensity of the cardiac afferent stimulus, the

degree of joint involvement and the sensitivity of the patient. The process is self limited; it is little affected by any type of therapy. It seems to be the result of sympathetic nerve disturbance caused by myocardial ischemia and preexisting arthritic lesions of the shoulder and hand.

Cor Pulmonale.—Scott and Garvin report postmortem studies of 50 cases of cor pulmonale. The series occurred among 6,548 consecutive necropsies, among which 790 deaths occurred from heart disease. The most noteworthy clinical features were the relatively short duration and progressive nature of the symptoms of right ventricular failure and the fact that 43 patients died of their first attack of heart failure. The majority were more than 50 years of age. Of the 32 in whom pulmonary emphysema was the major disease, 1 patient was 35 years of age, 10 patients were between 40 and 50, 12 were between 50 and 60, and 9 were more than 60. Only 2 of them were women; 32 of the 50 were foreign born, most of them in southeastern Europe. The postmortem observations support the conclusions of older clinicians and pathologists regarding the relation between chronic emphysema and failure of the right side of the heart. All but 4 of the 50 patients had emphysema alone or complicated by bronchiectasis, tuberculosis, silicosis or silico-tuberculosis. The lungs were normal in 2, 1 had conglomerate silicosis and 1 had extensive fibrosis. The weights of the hearts varied between 250 and 720 Gm.; the approximate average was 457 Gm. The thickness of the 50 right ventricles varied from 5 to 14 mm, and that of the left from 10 to 20 mm. The clinical course and postmortem observations indicate that the right ventricle is burdened in emphysema, presumably by an elevated pulmonary pressure, and that it undergoes dilatation and hypertrophy and ultimately fails. This is shown clearly by 2 cases in which an aneurysm at the root of the aorta compressed the main pulmonary artery. In most cases the left ventricle also was hypertrophic, but its cause was not apparent. However, as the anatomic relation of the two ventricles is so intimate, hypertrophy of one chamber probably ultimately involves the other.

Peripheral Arteriosclerotic Disease.—Atlas believes that sympathetic vasoconstrictor tone constitutes a barrier to the medical treatment of peripheral arteriosclerosis. He cites a case to illustrate the possible outcome if the sympathetic vasoconstrictor tone is not eliminated surgically. In this patient suffering from intermittent claudication, with pain and severe subjective coldness of his right foot, three months of intravenous injections of hypertonic saline solution, short wave diathermy, treatment with the intermittent venous occlusion cuff twice a week, warm leg baths daily, Buerger's exercises and whisky gave no relief. A lumbar sympathectomy was advised but the patient refused. Two years later advanced color changes, with atrophy of the skin and subcutaneous tissue of the foot, appeared. The pain was very severe. The condition progressed to massive gangrene of the foot requiring amputation. The author has since performed twenty lumbar sympathectomies in cases of this kind. Twelve of the patients have been observed for a year or longer. Following operation the patients received no further therapy except routine care of the feet or the local treatment of ulceration. Clinically they had a collateral vascular network that was not incapable of hypertrophy and in which the small vessel bed had retained its flexibility. Relief of symptoms (persistent coldness, numbness and paresthesias), speed of healing of ulcerations, relief of intermittent claudication and increase in the vascular reserve through hypertrophy of a collateral circulation when vasoconstrictor tone is removed surgically may be expected.

American Journal of Clinical Pathology, Baltimore

11:549-624 (July) 1941

- Bacteriophage Service in Staphylococcal Infections. W. J. MacNeal, Frances C. Frisbee and Margaret A. McRae, New York—p. 549.
- Erythrocyte Sedimentation Test. M. M. Wintrobe, Baltimore—p. 562.
- Observations on Blood Sedimentation Mechanism. I. R. Morrison, Kansas City, Kan—p. 578.
- Diagnostic Methods in Chronic Ulcerative Colitis. Critical Analysis of Procedures Used in Differential Diagnosis of Diarrheas and Dysenteries. M. Paulsen, Baltimore—p. 588.
- Carcinoma of Tail of Pancreas and Diabetes. M. E. Sano, Philadelphia—p. 605.
- Agglutinating Properties of Antitubercular Rabbit Serum. B. Winer, Durham, N. C.—p. 617.

American Journal of Medical Sciences, Philadelphia

202:157-312 (Aug.) 1941

- Effect of Age on Susceptibility of Erythrocyte to Hypotonic Salt Solutions: Radioactive Iron as Means of Tagging Red Blood Cell. W. O. Cruz, P. F. Hahn, W. F. Bale and W. M. Balfour, Rochester, N. Y.—p. 157.
- Erythrocyte Fragility Changes Produced by Sulfanilamide. W. Antopol, L. Goldman, Newark, N. J., and W. L. Sampson, Rahway, N. J.—p. 163.
- Pernicious Anemia Complicated by Myelogenous Leukemia. E. H. Sterne Jr., H. Schiro and W. Molle, Cincinnati.—p. 167.
- *Hematologic Changes Following Splenectomy in Man, with Particular Reference to Target Cells, Hemolytic Index and Lysolecithin. K. Singer, E. B. Miller and W. Dameshek, Boston.—p. 171.
- *Hemophilus Influenzae Type A Endocarditis. H. M. Rose, New York.—p. 187.
- Critical Rates in Ventricular Conduction: Unstable Bundle Branch Block. H. Vesell, New York.—p. 198.
- Subacute Bacterial Endocarditis on Right Ventricular Wall Opposite Ventricular Septum Defect. L. A. Eigen, West Orange, N. J., and A. R. Abel, Orange, N. J.—p. 207.
- Intracranial and Peripheral Vascular Effects of Nicotinic Acid. J. Loman, M. Rinkel and A. Myerson, Boston.—p. 211.
- Vasomotor Disturbances in Peripheral Neuritis. R. W. Wilkins and L. C. Kolb, Baltimore.—p. 216.
- Blood and Urine Chlorides in Twenty-Two Cases with Diabetes Insipidus. H. Blotner, Boston.—p. 222.
- Adsorption of Surface-Active Substances of Urines, with Special Reference to Malignant Neoplasia. K. Stern, New York.—p. 229.
- Carcinoma of Papilla of Vater: Clinical Features in Forty Cases. W. S. Sharpe and M. W. Comfort, Rochester, Minn.—p. 238.
- Analysis of Diabetic Morbidity and Mortality in a General Hospital. H. Pollack, H. Dolger and M. Ellenberg, New York.—p. 246.
- *Incidence of Trichinosis in New York City. H. Most and M. Helpern, New York.—p. 251.
- Negative Therapeutic and Metabolic Effects of Synthetic Alpha-Tocopherol (Vitamin E) in Muscular Dystrophy. M. M. Harris, New York.—p. 258.
- *Addison's Disease: Treatment and Prognosis. H. P. Hampton and E. J. Kepler, Rochester, Minn.—p. 264.

Hematologic Changes Following Splenectomy.—According to Singer and his colleagues, their hematologic study of 19 splenectomized patients supports the concept that one or more splenic hormones exist and confirms the frequently expressed view that the spleen aids in blood destruction. Howell-Jolly bodies in erythrocytes were a constant finding after splenectomy, and target cells—abnormally thin erythrocytes—were usually present. The presence of the latter and the thinness of the erythrocytes adequately account for the increased hypotonic resistance usually seen and confirm previous work showing that the spleen makes erythrocytes thicker and more fragile to hypotonic saline solutions. A lowered urobilinogen output in feces was usually found after splenectomy, indicating a diminution in hemoglobin destruction. Lysolecithin metabolism was definitely altered after splenectomy. Bergenhem and Fähræus believe that this normal serum lysin is produced in the spleen. Leukocytosis and thrombocytosis were common and with the presence of the Howell-Jolly bodies suggest that splenectomy probably removes certain normal inhibitory mechanisms of the spleen on the bone marrow. The observations indicate that the spleen has direct effects on the erythrocytes which traverse its sinusoids and indirect effects on the hemopoietic cells of the bone marrow.

Hemophilus Influenzae Type A Endocarditis.—Rose reports the first case of bacterial endocarditis caused by typical Hemophilus influenzae. The clinical course and pathologic changes did not differ significantly from those observed in subacute bacterial endocarditis caused either by Hemophilus parainfluenzae or Streptococcus viridans. The infection apparently originated in the maxillary sinus, with subsequent implantation on a congenitally anomalous aortic valve. This was followed by a prolonged fever, repeated embolism, splenic infarction and terminal acute myocardial insufficiency. Toward the end of the illness polymorphonuclear leukocytosis developed and was accompanied by signs suggestive of thrombosis of the superior vena cava. At necropsy no thrombosis could be demonstrated, and the absence of pulmonary edema and the evidence of passive congestion of the liver and spleen indicate that these changes were due primarily to extreme right heart failure. The myocardium presented numerous areas of recent degeneration and scarring, but there was less embolization of the coronary arteries than reported for Strep. viridans endocarditis. The localization of the bacterial infection on the bicuspid aortic valve adds emphasis to the well established fact that antecedent injuries or congenital abnormalities of the heart valves are a sine qua non in subacute bacterial endocarditis, whatever the

infecting agent. The illness lasted approximately five months and its course was typically subacute. Sulfanilamide had no effect on the prognosis. Until further evidence is had the classification of influenzal endocarditis must remain bacteriologic, as thus far no striking differences between true influenzal and parainfluenzal infection are known.

Incidence of Trichinosis in New York City.—Most and Helpern endeavored to discover the incidence of human infection with Trichinella spiralis in New York City by using the digestion, press and microscopic methods on parts of the bodies of 100 persons dying by violence or suddenly. An infection of 22 per cent was found, suggesting that human trichinosis in New York City is considerable and beyond that clinically appreciated or recognized. The authors believed the digestion of large amounts of muscle, preferably the diaphragm, to be the most feasible and reliable method for determining infection in man. The method will detect the largest number of positive cases in contrast to other methods, especially if the infection is light. The relative efficacy of detecting positive cases of infection by the three methods employed was in the ratio of 21 to 11 to 8, respectively. Without the digestion method the incidence determined would have been 12 per cent.

Addison's Disease.—Hampton and Kepler present data on 110 cases of Addison's disease seen at the Mayo Clinic between October 1933 and January 1941. There was evidence in 37 of tuberculosis of the lungs, bones, kidneys, genitals or cervical lymph nodes. Atrophy of adrenal tissue was the likely etiologic factor in most of the remaining 73 cases. Of the 110 cases, an associated disease that might have influenced mortality and morbidity was present in 41. The 19 patients who refused to adhere to the low potassium diet after they left the hospital, although they continued to take sodium chloride, sodium citrate and varying amounts of adrenal cortex extract, comprise a fairly satisfactory control group. Of the group following a low potassium diet, 88 per cent lived more than one year and 40 per cent lived more than four years after beginning treatment. Of the control group, 53 per cent lived more than one year and 18 per cent were alive at the end of four years. Of 23 patients who died while adhering to the low potassium diet, 11 died in crises. The other 12 deaths occurred because of an associated complication which probably may not have been fatal if Addison's disease was not present also. The authors know of 18 patients who are still being sustained by the low potassium diet, sodium chloride and sodium citrate; only 3 of them require adrenal cortex extract regularly and the others use it during periods of stress or illness. Of these 18 patients, 8 are able to work regularly at their occupations, 2 work regularly except during extremely hot weather, 7 work part time and 1 is unable to work. Fourteen patients who had been maintained on the low potassium diet were subsequently given daily hypodermic injections of desoxycorticosterone acetate, and the low potassium diet was discontinued. Following this change their health improved so that all but 2 are able to carry on normal activities. A low potassium diet, high intake of sodium salts and desoxycorticosterone acetate given to 9 patients did not produce good results. Only 1 patient remained well. In 2 diarrhea and other symptoms suggestive of impending crisis occurred. These symptoms disappeared in 1 after desoxycorticosterone acetate and in the other 1 after the low potassium diet were discontinued. Five of the other 6 patients died within two and 1 within six months after beginning treatment. All of these deaths occurred before the danger of the concurrent use of a low potassium diet, a high sodium intake and desoxycorticosterone acetate was known. Consequently treatment was modified so that each patient given desoxycorticosterone acetate also had a diet that contained an amount of potassium equal to that of an average diet. Since these changes were instituted, 32 patients have been treated. Thus far only 1 fatality has occurred. Sixteen of the 31 patients now being treated with desoxycorticosterone acetate are able to work every day and state that they feel well, 10 are able to work most of the time and 5 are able to work occasionally. All the patients are instructed to take from 2 to 5 Gm. of table salt daily. The daily hypodermic dose of desoxycorticosterone acetate varies from 2 to 5 mg. If the patient is unable to eat and the daily intake of potassium falls below 4 or 5 Gm., potassium chloride tablets should be taken.

American Journal of Ophthalmology, Cincinnati

24:611-730 (June) 1941

- Lens Opacities Associated with Experimental Calcium Deficiency: Preliminary Report. K. C. Swan and P. W. Salit, Iowa City.—p. 611.
- Partial Coloboma of Scleral-Limbus Zone with Visible Schlemm's Canal. K. W. Ascher, Cincinnati.—p. 615.
- Fifty Years' Experience in Ocular Motility: Part II. W. B. Lancaster, Hanover, N. H.—p. 619.
- Sterilization of Sharp Instruments by Chemical Solutions. M. H. Post, St. Louis.—p. 624.
- Antibacterial Action of Tears on Staphylococci. R. Thompson and E. Gallardo, New York.—p. 635.
- Practical Comments on Refraction. R. O'Connor, San Francisco.—p. 640.
- Experimental Acute Iridocyclitis in Rabbits Produced by Coliform Bacteria Isolated from Upper Respiratory Tract of Man. C. Berens and Edith L. Nilson, New York.—p. 645.
- Keratitis Due to Mumps. R. W. Danielson and J. C. Long, Denver.—p. 655.
- Late Developments in Case of Gyrate Atrophy of Choroid and Retina (Fuchs). H. H. McGuire and W. P. McGuire, Winchester, Va.—p. 657.
- Pasmomma of Orbit. W. E. Fry and P. DeLong, Philadelphia.—p. 664.
- Rare Form of Glaucoma. S. J. Beach and E. E. Holt Jr., Portland, Maine.—p. 668.
- Boeck's Sarcoid of Lacrimal Gland, with Bilateral Iridocyclitis. H. R. Sniderman, Toronto, Canada.—p. 675.
- Attempt to Produce Dinitrophenol Cataracts in Hypothyroid Rats. G. K. Smelser, New York.—p. 680.
- Streptothricosis of Lacrimal Canaliculi: Report of Nine Cases. A. J. Elliot, New York.—p. 682.

American Journal of Pathology, Boston

17:469-642 (July) 1941

- Visceral Lesions in Infectious Polyneuritis (Infectious Neuritis, Acute Polyneuritis with Facial Diplegia, Guillain-Barré Syndrome, Landry's Paralysis). A. B. Sabin and C. D. Aring, Cincinnati.—p. 469.
- Metastatic Tumors of Myocardium: Review of Sixteen Cases. G. Ritchie, Madison, Wis.—p. 483.
- Lobular Carcinoma in Situ: Rare Form of Mammary Cancer. F. W. Foote Jr. and F. W. Stewart, New York.—p. 491.
- Histogenesis of Ewing's Tumor. F. W. Foote Jr., New York, and H. B. Anderson, Johnstown, Pa.—p. 497.
- Endothelial Myeloma (Ewing's Tumor of Bone). V. V. Gharpure, Bombay, India.—p. 503.
- Effect of Pituitary Growth Hormone on Epiphyseal Disk of Tibia of Rat. R. D. Ray, H. M. Evans and H. Becks, San Francisco.—p. 509.
- Changes in Incisor Teeth of Albino Rats with Vitamin A Deficiency and Effects of Replacement Therapy. I. Schour, M. M. Hoffman, Chicago, and M. C. Smith, Tucson, Ariz.—p. 529.
- Occurrence of Mitotic Divisions in Glomeruli in Glomerulonephritis and Malignant Sclerosis. P. H. Hartz, A. van der Sar and A. van Meeteren, Curacao, Netherland West Indies.—p. 563.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

46:1-144 (July) 1941

- Tomography of Larynx. R. M. Caulk, Washington, D. C.—p. 1.
- Treatment of Laryngeal Cancer by Irradiation. D. Quick, New York.—p. 11.
- Causes of Failure of Roentgen Therapy in Cancer of Larynx. M. Lenz, New York.—p. 21.
- Cancer of Larynx: Surgical Treatment. L. A. Schall, Boston.—p. 30.
- Difficulties in Differentiating Midbrain Lesions from Cerebellar Lesions. H. O. Peterson and A. B. Baker, Minneapolis.—p. 37.
- Chest Roentgenograms in Polycythemia Vera and Polycythemia Secondary to Pulmonary Arteriosclerosis. P. J. Hodes and J. Q. Griffith, Philadelphia.—p. 52.
- *Localized Subacute Phlegmonous Gastritis (So-Called Botryomycosis) Simulating Pyloric Carcinoma. A. Vass and D. M. Sirca, Springfield, Ill.—p. 59.
- Pancreatic Lithiasis. E. E. Smith and A. Bonis, New York.—p. 64.
- *Tumors in One of Homologous Twins: Hodgkin's Disease; Osteogenic Sarcoma. H. Charache, Brooklyn.—p. 69.
- Swallowing of Miscellaneous Objects: Some Cases. E. de Bernardi, Trieste, Italy.—p. 75.
- End Results in Irradiated Hodgkin's Disease. F. W. O'Brien, Boston.—p. 80.
- Effects of Roentgen Ray Dosage in Breast Carcinoma. A. Beach, San Antonio, Texas.—p. 89.
- Effect of Roentgen Therapy on Infections Produced in Skin of Rabbits with Cultures of Streptococcus Hemolyticus and Staphylococcus Aureus. D. M. Angevine and A. Tubble, New York.—p. 96.
- Localized Subacute Phlegmonous Gastritis.—Vass and Sirca report an instance of primary localized phlegmonous gastritis which resembled so-called botryomycosis in a white woman aged 54. Roentgenologically the lesion could not be differentiated from an annular carcinoma of the pylorus, and microscopically it consisted of granulation tissue with abscesses in which so-called botryomycotic granules, consisting of coalescent tissue and staphylococci, were found. Within one month the pyloric end of the stomach, which at first showed a moderate

and fairly well localized rigidity of the wall without any filling defects or gross irregularity, presented definite thickening of the wall and almost complete occlusion of the lumen. The mucosal pattern was faintly visible during the first roentgen examination and was completely obliterated at the second examination. The mucosal pattern could not be demonstrated, probably because the affected portion of the stomach did not fill at the time of the second examination and the mucosal folds were obliterated by the swelling of the wall. The authors believe chronic hypertrophic gastritis, which was present, to be the cause of the lesion.

Tumors in One of Homologous Twins.—Charache presents histories of three pairs of homologous twins in which only 1 of each pair was affected; only 1 twin of two pairs had Hodgkin's disease and 1 of the other pair had osteogenic sarcoma. The 3 respective affected twins have died, but the homologous living twins are free from any symptoms and physical signs four years and two months, five and a half years and eight years since the disease was first recognized in the deceased twin.

American Journal of Tropical Medicine, Baltimore

21:507-604 (July) 1941

- Studies on Murine Origin of Typhus Epidemics in North China: I. Murine Typhus Rickettsia Isolated from Body Lice in Garments of Sporadic Case. Wei-T'ung Liu and S. H. Zia, Peiping, China.—p. 507.
- Infection of Anopheles Quadrimaculatus with Plasmodium Cynomolgi, Monkey Malaria Parasite, and with Plasmodium Lophurae, Avian Malaria Parasite. L. T. Coggeshall, New York.—p. 525.
- Diagnostic and Epidemiologic Significance of Complement Fixation Test in Human Malaria. I. J. Kligler and M. Yoeli, Jerusalem, Palestine.—p. 531.
- Yaws and Syphilis; the Same or Different? Should Discussion Be Continued? E. H. Hudson, Athens, Ohio.—p. 545.
- Experimental Malaria Infections in Anopheles Stephensi from Contrasting Sea Water and Tap Water Larva Environments. P. F. Russell, New York, and B. N. Mohan, Guindy, Madras, India.—p. 553.
- Observations on Anopheles of British Honduras. H. W. Kumm and L. M. Ram, San José, Costa Rica, Central America.—p. 559.
- Problems Encountered in Growth of Endamoeba Histolytica in Cultures Developed by Microisolation. C. W. Rees, Lucy V. Reardon, L. Jacobs and Frances Jones, Washington, D. C.—p. 567.
- Comparison of High and Low Subcultures of Yellow Fever Vaccine (17D) in Human Groups. H. H. Smith, H. Calderón-Cuervo and J. P. Leyva, Bogotá, Colombia, South America.—p. 579.
- Spherule Formation in Culture by Coccidioides Immitis Rixford and Gilchrist, 1896. E. E. Baker, San Francisco, and E. M. Mrak, Berkeley, Calif.—p. 589.
- Vesicular Test: Diagnostic Method of Infection by Poradenic (Lymphogranuloma Inguinale) Virus. C. Ottolina, Caracas, Venezuela, South America.—p. 597.

American Review of Tuberculosis, New York

44:123-254 (Aug.) 1941

- Pulmonary Insufficiency: II. Effects of Various Types of Collapse Therapy on Cardiopulmonary Function. A. Courmand and D. W. Richards Jr., New York.—p. 123.
- Collapse Therapy in Moderately Advanced Tuberculosis: Inquiry into Case Selection and Statistical Study of End Results. K. M. Soderstrom, Seattle.—p. 173.
- Jacolaues Operation: Plea for Its Early Use in Treatment of Incomplete Collapse. S. A. Thompson, New York, and M. Greenberg, Hillside, N. J.—p. 183.
- *Tubercle Bacilli in Cavity Drainage (Monaldi). E. Bogen and W. Dunn, Olive View, Calif.—p. 191.
- Relation of Sex to Course of Experimental Tuberculosis in Mice. E. R. Long and Agnes Beebe Vogt, Philadelphia.—p. 196.
- *Frequency of Tuberculous Lesions at Autopsy: Some Epidemiologic Inferences. K. E. Landé, Hagerstown, Md., and G. Wolff.—p. 223.
- Pulmonary Histoplasmosis: Report of Two Cases. H. E. Meleney, Nashville, Tenn.—p. 240.

Tubercle Bacilli in Cavity Drainage.—Bogen and Dunn examined all of the material aspirated from 17 tuberculous cavities by the Monaldi method of transthoracic puncture and prolonged suction drainage. They compared their observations with those of the sputum obtained from the same patients. Tubercle bacilli diminished or disappeared from the aspirated specimens in many cases. Physiologic, pathologic and bacteriologic factors which may contribute to this result include mechanical removal of bacteria and other cavity contents, intercellular lavage by induced transudation, increase in the hydrogen ion concentration and changes in the composition of the gaseous milieu.

Frequency of Tuberculosis.—Landé and Wolff looked for tuberculous lesions among 165 necropsies of persons who died of various diseases. The incidence of positive observations

among 128 necropsies of adults more than 20 years of age amounted to 62, or 48.4 per cent. The childhood frequency was small, with no tuberculous manifestation in infancy and an incidence of only 3 positive observations among the 37 necropsies of patients from birth to 19 years of age, a percentage of 8.1. On the basis of these statistics it may be assumed that the number of infected and pathologically marked persons has been greatly reduced from about 100 per cent at the turn of the century to around 50 per cent at present among the unselected hospital population. If this reduction can be substantiated in larger population groups it would confirm the success of preventive medicine and public health activity in the fight against tuberculosis. If the still greater fatality decrease during the same period from around 200 at the beginning of the century to around 50 per hundred thousand in the last years is considered, the percentage decrease of tuberculosis mortality is twice as high as the reduction of infected people. Therefore it may be assumed that the infected proportion of the population exhibits a considerable diminution of tuberculosis mortality. It seems probable that the risk of an infected person to die from tuberculosis has been reduced from 2-2.8:1,000 to 1-1.4:1,000 at present. This also might be interpreted as representing the results of therapy, improvement of social conditions and possibly a change involved in tuberculosis epidemiology. The decrease in tuberculosis mortality appears to be caused by the reduction of the sources of infection and, to an equal extent, by treatment.

Archives of Neurology and Psychiatry, Chicago

46:197-376 (Aug.) 1941

- Analysis of 100 Cases of Schizophrenia with Recovery. T. A. C. Rennie, with assistance of J. B. Fowler, Baltimore.—p. 197.
- Fiber Connections of Corpus Striatum as Seen in Marchi Preparations. S. W. Ranson, S. W. Ranson Jr. and Mary Ranson, Chicago.—p. 230.
- Acute Postoperative Aseptic Leptomeningitis: Review of Cases and Discussion of Pathogenesis. A. I. Finlayson, Rochester, Minn., and W. Penfield, Montreal, Canada.—p. 250.
- Pathologic and Mental Alterations in Case of Simmonds' Disease. R. C. Wadsworth and Clementine McKeon, Boston.—p. 277.
- Displacement and Herniation of Hippocampal Gyrus Through Incisura Tentorii: Clinicopathologic Study. G. A. Schwarz, Philadelphia, and A. A. Rosner, New York.—p. 297.
- Influence of Locomotion on Plantar Reflex in Normal and in Physically and Mentally Inferior Persons: Theoretical and Practical Implications. P. I. Yakovlev and M. J. Farrell, Waverley, Mass.—p. 322.
- Patterns of Cerebral Integration Indicated by Scotomas of Migraine. K. S. Lashley, Cambridge, Mass.—p. 331.
- Anosognosia and Autopagnosia. C. W. Olsen and C. Ruby, Los Angeles.—p. 340.

Archives of Surgery, Chicago

43:169-326 (Aug.) 1941

- *Problem of Anoxia in Surgery and Anesthesia: Report of Experimental and Clinical Cases and Review of Literature. J. G. Schnedorf, P. H. Lorhan and T. G. Orr, Kansas City, Kan.—p. 169.
- Early Carcinoma of Colon: I. Nature and Adequate Treatment of Small Carcinomas. J. A. Bergen, C. D. L. Cromar and C. F. Dixon, Rochester, Minn.—p. 186.
- Id.: II. Relation Between Subclinical Inflammatory Processes and Carcinoma. J. A. Bergen, D. L. Cromar and C. F. Dixon, Rochester, Minn.—p. 192.
- Studies on Prostatic Cancer: II. Effects of Castration on Advanced Carcinoma of Prostate Gland. C. Huggins, R. E. Stevens Jr. and C. V. Hodges, Chicago.—p. 209.
- *Recurrence of Hyperthyroidism. E. B. Eckerson, New York.—p. 224.
- *Cephalin-Cholesterol Flocculation Test in Cases of Disease of Liver, with Special Reference to Diagnosis of Mild and Unsuspected Forms. D. H. Rosenberg, Chicago.—p. 231.
- Role of Adrenal Glands in Shock: Value of Desoxycorticosterone Acetate in Prevention of Operative Shock. E. L. Besser, Iowa City.—p. 249.
- Squamous Cell Carcinoma Arising in Chronic Osteomyelitic Sinus Tract with Metastasis. E. S. Bereston, Baltimore, and C. Ney, New York.—p. 257.
- Pancreatic Fistula: Clinical and Experimental Observations. J. M. McCaughan and H. K. Purcell, St. Louis.—p. 269.
- Sympathetic Nervous System in Neurogenic and Renal Hypertension: Experimental Correlation and Clinical Consideration. K. S. Grimson, Chicago.—p. 284.
- Review of Urologic Surgery. A. J. Scholl, Los Angeles; F. Hinman, San Francisco; A. von Lichtenberg, Mexico, D. F., Mexico; A. B. Hepler, Seattle; R. Gutierrez, New York; G. J. Thompson, J. T. Priestley, Rochester, Minn.; E. Wildbolz, Berne, Switzerland, and V. J. O'Connor, Chicago.—p. 306.

Anoxia in Surgery and Anesthesia.—Schnedorf and his associates report 2 deaths due to anoxia and 2 instances of cerebral degeneration due to anoxia produced in dogs. Their first patient was suffering from chronic anemic anoxemia because of a low level of hemoglobin (31 per cent) on admis-

sion to the hospital. He had shown some mental aberration before admission. These changes were probably due to the profound anemic anoxemia. Anoxia at the time of operation resulted from several contributory factors: preoperative medication with pentobarbital sodium, morphine sulfate and scopolamine hydrobromide, spinal anesthesia, pulmonary edema and increased permeability of capillaries. Thus all types of anoxemia played a part in the cerebral anoxia and death of this patient. The anoxic conditions of the patient were reproduced in 2 dogs. A fall in blood pressure to 40 mm. of mercury was produced by trauma to a hindlimb. The spinal anesthetic produced flaccid paralysis of the hind extremities and of the abdomen, but the dogs exhibited running movements with their forelegs. The animals were killed in thirty-six hours, when they were dying. Microscopic sections of the cerebral cortex showed degenerative changes similar to but milder than those observed in the patient. That the changes were less extensive was probably due to the shorter survival period of the animals and to the absence of anemia. The authors' other patient died from cerebral anoxia incidental to ether anesthesia. The anoxia which caused restlessness, twitchings and convulsions was made worse by the administration of chloral hydrate. The authors used cyanosis as a criterion for anoxemia in both of their patients. However, anoxemia is present long before cyanosis becomes visible and cyanosis can be present without anoxemia. Cyanosis depends on the presence of about 5 Gm. of reduced hemoglobin for each hundred cubic centimeters of circulating blood. An anemic patient with less than this amount of hemoglobin cannot usually become cyanotic until he is dying, but a patient with polycythemia and a hemoglobin content of 19 Gm. may well have 5 Gm. of reduced hemoglobin per hundred cubic centimeters and show cyanosis but not have anoxemia.

Recurrence of Hyperthyroidism.—Eckerson suggests that the primary reason for the postoperative persistence or recurrence of hyperthyroidism is that subtotal thyroidectomy attacks only a manifestation of the disease. It is surprising that recurrence is not more frequent, as patients with hyperthyroidism have an inferior basic nervous equipment. In most cases recurrence of symptoms within one year or later is probably caused by the removal of too little thyroid tissue, too large remnants of the lateral lobes may have been left, the isthmus may not have been touched, a pyramidal lobe may have been left or an intrathoracic portion of a nodular goiter may have been overlooked. Recurrence and persistence usually occur with the diffuse or hyperplastic type of toxic goiter. Social or economic problems, nervous shocks, endocrine adjustments and foci of infection can all be factors in inciting recurrent hyperthyroidism. Among 469 patients with toxic thyroids operated on between 1930 and 1939 inclusive there were 34 recurrences. During the first five years 224 patients were operated on; in 8 of these the disease persisted and in 13 it recurred, these 21 patients had the diffuse type of goiter. Among these 224 patients there were 5 operative deaths. Two hundred and two were followed for from one to six years. Two of the patients died of other causes within one to two years. Of the 224 patients operated on during this five year period 114 have been followed for from five to ten years. Of the 21 with recurrent or persistent hyperthyroidism, 16 have been followed continually, 1 until his death, and 4 were lost to follow-up within three years after their second attack of hyperthyroidism. A total of 21 recurrences has been noted for the 114 completely followed-up patients. This makes an incidence of 18.4 per cent. The treatment of persistent and recurrent hyperthyroidism depends on the individual patient and on the severity of the disease. It consists of iodine, roentgen therapy and surgical intervention or a combination of these, and rehabilitation by the social service department.

Cephalin-Cholesterol Flocculation Test.—Rosenberg determined the reliability of the cephalin flocculation test in revealing active hepatic damage. The results obtained in 155 selected patients (34 with irrefutable clinical evidence of hepatic disease, 38 with signs and symptoms suggesting mild chronic hepatic disorders and 72 whose routine histories and physical examinations revealed no evidence of such disease) are presented. The reaction was positive in the serum of all patients with acute hepatitis, cirrhosis and chronic passive congestion of

the liver. In the serum of patients with hepatic carcinoma it seemed to be related to the extent of the malignant involvement. Clinical improvement was accompanied with a decrease in the flocculation reaction. Of the patients with obstructive jaundice, flocculation reactions were negative in the serums of only 2 and slight in most of the others. The flocculation test may be of distinct value in differentiating obstructive from parenchymatous jaundice. Either a negative or a slightly positive reaction suggests the obstructive form, and the strongly positive reactions early in the course of jaundice suggest the parenchymatous form. A form of postarsphenamine jaundice, recently described by Hanger and Gutman, giving a negative flocculation reaction is believed to be due to intrahepatic biliary obstruction rather than to parenchymatous changes. The flocculation tests of the 38 patients clinically suspected of having hepatic disease were all positive. In 33 the diagnosis was confirmed by other means, and in 5 presumptive clinical evidence had been elicited. Of the 72 subjects of the third group, 12 were "normal" adults and 60 were patients with miscellaneous diseases. Forty-three gave positive flocculation reactions. In 25 of these one or more supplementary tests of hepatic function revealed abnormalities, and in 3 others confirmatory evidence of disease of the liver was found at operation, necropsy or biopsy. Five of the 28 in whom the disease was established had regarded themselves as normal, healthy adults. A bromsulphalein test was performed in 21, the excretion was normal in 6 and the hippuric acid test was normal in 8 of 16. Of the remaining 15 patients with positive flocculation reactions for whom adequate confirmatory studies could not be made, further clinical study revealed a history of dyspepsia in 2, hepatic tenderness or enlargement in 4, sulfanilamide (20 Gm.) therapy in 1, hyperthyroidism in 3, ulcerative colitis in 1, glomerulonephritis in 2, infectious mononucleosis in 1 and pernicious anemia with involvement of the cord in 1. These data indicate that mild and subclinical disease of the liver is much more common than is generally appreciated or clinically recognized. Early diagnosis is of utmost importance, for only in its early stage can appropriate therapy successfully arrest the pathologic process and restore normal function.

Canadian Public Health Journal, Toronto

32:339-386 (July) 1941

- Venereal Disease Control. G. Bates, Toronto.—p. 339.
Health Survey of Rural Manitoba Youth. C. G. Sheps, Winnipeg, Man.—p. 350.
Value of Food Inspection and Properly Trained Food Inspectors. A. J. Slack, London, Ont.—p. 357.
Errors in Calculation of Nutritive Value of Food Intake: I. Comparison of Calculated and Determined Amounts of Calories, Protein and Fat. J. M. Patterson and E. W. McHenry, Toronto.—p. 362.

Cancer Research, Philadelphia

1:439-516 (June) 1941

- Effects of Estrogen on Mammary Gland of Mice Injected During Pregnancy, Lactation and Retrogression. L. Loeb and V. Sontzeff, St. Louis.—p. 439.
Incidence of Mammary Gland Carcinoma and Cancer Age in Mice Injected with Estrogen and in Noninjected Mice of Different Strains. V. Sontzeff, M. M. Kirtz, H. T. Blumenthal and L. Loeb, St. Louis.—p. 446.
Tumor Inhibition Associated with Secretory Changes Produced by Estrogen in Transplanted Mammary Adenocarcinoma of Rat. M. J. Eisen, New York.—p. 457.
Inhibition of Phospholipid Oxidation by Carcinogenic and Related Compounds. H. P. Rusch and B. E. Kline, Madison, Wis.—p. 465.
Effect of Heptyl Aldehyde-Sodium Bisulfite on Spontaneous Tumors of Mammary Gland in Mice. L. C. Strong, New Haven, Conn.—p. 473.
Further Investigation of Induced Tumors in Fowls. J. B. Murphy and E. Sturm, New York.—p. 477.
Studies on Changes in Lymphoid Tissue of Mice Treated with Carcinogenic and Noncarcinogenic Hydrocarbons. Cornelia Hoch-Ligeti, London, England.—p. 484.
Experimental Tumors in Lymph Nodes and in Endocrine and Salivary Glands. C. C. Franseen, J. C. Aub and Carol L. Simpson, Boston.—p. 489.
Studies on Transplantable Embryoma of Mouse. Elizabeth B. Jackson and A. M. Brues, Boston.—p. 494.
Persistence of Growth Inhibition in Young Rats Induced by 1, 2, 5, 6-Dibenzanthracene. H. Alapy, Budapest, Hungary.—p. 499.
Growth Rates of Nine Inbred Strains of Mice. Alma Howard, Montreal, Canada.—p. 503.

Connecticut State Medical Journal, Hartford

5:555-632 (Aug.) 1941

- Multiple Aneurysms of Splenic, Gastric, Renal and Superior Mesenteric Arteries. D. F. Levy, New Haven.—p. 567.
Swimming Places and Public Health. W. J. Scott, Hartford.—p. 570.

Delaware State Medical Journal, Wilmington

13:143-158 (July) 1941

- Significance of Precordial Pain. G. C. Griffith, Philadelphia.—p. 143.
Compound Presentation Complicated by Sacculation of Lower Uterine Segment. J. S. Keyser and I. Slovin, Wilmington.—p. 149.

Journal of Clin. Endocrinology, Springfield, Ill.

1:461-546 (June) 1941. Partial Index

- Estrogen and Progesterone Metabolism in Pregnancy: I. Spontaneous and Induced Labor. O. W. Smith, G. Van S. Smith and Sara Schiller, Brookline, Mass.—p. 461.
Hormone Therapy and Sex Hormone Excretion: I. Effect of Progesterone and Gonadotropic Hormone of Mare's Serum on Excretion of Estrogens, Androgens and Sodium Pregnanediol Glucuronide by Women During Normal and Abnormal Menstrual Cycles. L. T. Samuels, Nora Winther and Naomi Yolton, Minneapolis.—p. 485.
Stilbestrol: Clinical Effect of Stilbestrol on Postpartum Activity of Mammary Glands. A. W. Diddle and W. C. Keettel Jr., Iowa City.—p. 494.
Methyl Testosterone: I. Androgenic Effects and Production of Gynecomastia and Oligospermia. E. P. McCullagh and H. R. Rossmiller, Cleveland.—p. 496.
Gynecomastia: Hypertrophy of Male Breast. M. L. Lewin, New York.—p. 511.
Thyroid and Growth: Effect of Thyroid Hormone on Growth in Thyrotoxic and Myxedematous Children and Adolescents. S. Hertz and C. Galli-Mainini, Boston.—p. 518.
Thyrogonadal Interrelationships: Clinical Studies of Thyrogonadal Correlates: I. Basal Metabolic Rates and Endometrial Responses. E. C. Hamblen, R. L. Pullen and W. K. Cuyler, Durham, N. C.—p. 523.
Hypothyroidism: Umbilical Hernia of Infantile Myxedema. W. A. Reilly, San Francisco.—p. 532.
Diabetes Mellitus: Use of Anterior Pituitary Extracts in Uncontrolled Diabetes Mellitus with Growth and Sexual Retardation. J. A. Greene, L. E. January and L. W. Swanson, Iowa City.—p. 538.

1:547-620 (July) 1941

- Progesterone: Value of Basal Fat in Human Uterus as Indicator of Optimal Progesterone Activity. J. Black, O. S. Heyns and J. Gillman, Johannesburg, South Africa.—p. 547.
Therapy of Functional Bleeding: Value of Pregnenolone in Treatment of Functional Uterine Bleeding. J. A. Gaines, S. H. Geist and U. J. Salmon, New York.—p. 554.
Ethinyl Estradiol: Therapeutic Effectiveness of Orally Administered Ethinyl Estradiol. U. J. Salmon, S. H. Geist, R. I. Walter and N. Mintz, New York.—p. 556.
Estrogen Therapy: Comparison of Clinical Effectiveness of Estradiol Dipropionate and Estradiol Benzoate. R. R. Greene, Chicago.—p. 559.
Therapy of Functional Bleeding: Use of Testosterone Propionate in Functional Bleeding. W. A. Leff, Newark, N. J.—p. 562.
Dysmenorrhea: Anhydroxy Progesterone in Dysmenorrhea. S. D. Soule, St. Louis.—p. 567.
*Acne: Male Hormone Substance: Prime Factor in Acne. J. B. Hamilton, New Haven, Conn.—p. 570.
Nonhypogonadal Impotence: Treatment of a Case of Impotence with a Combination of Pituitary Gonadotropin and Testosterone. H. Freeman, Worcester, Mass.—p. 593.
Hyperinsulinism: Spontaneous and Artificial Hyperinsulinism. F. M. Allen, New York.—p. 595.
Diabetes: Lack of Perimetric Evidence for Pituitary Hypertrophy in Diabetes. L. L. Mayer, C. D. Strouse and S. Soskin, Chicago.—p. 604.
Diabetes: Attempt to Demonstrate "Anti-Insulin" Effect of Blood Plasma of Certain Diabetic Types. E. S. Gais and E. A. Weinbaum, New York.—p. 607.
Obesity: Calorigenic Action of Thyroid Substance in Obese Patients. M. B. Handelsman and M. B. Gordon, New York.—p. 612.

Acne and Androgen.—Hamilton discusses the relationship of androgen in experimentally induced and normally appearing acne in men, women and children. Thirty-one boys from 2 to 17 years of age were examined for comedones and cutaneous eruptions before, during and after the administration of androgen as trial therapy for certain types of cryptorchism. Injections of peanut oil were given as control observations. Eight eunuchoid and castrate men from 18 and 45 years of age were also given mock treatment and were later treated with active male hormone substance. Some patients have been observed for more than three years. Two ovariectomized women were studied following intramuscular administration of 20 mg. of testosterone propionate three times a week for from three to seven weeks. Both were in their fourth decade and had undergone ovariectomy one and two years, respectively, prior to treatment. Prior to treatment quantitative determinations were made of urinary estrogenic, androgenic and gonadotropic substances. The

severity of an acneiform response was judged by the presence, number, size and color of comedones and papules. Resumption of androgen therapy after a brief period of withdrawal caused papules that had undergone regression on cessation of therapy to take on color. This refers also to newly produced and reactivated eruptions. Eunuchoid individuals who did not mature sexually never had acne. When testosterone propionate was administered to eunuchoid and castrate men, to prepuberal boys and to ovariectomized women comedones, papules and pustules developed in some of them. When such treatment was terminated the acneiform responses diminished and began to disappear. Additional courses of medication at later dates were accompanied by similar responses with subsequent disappearance of the lesions during the intervals when testosterone compounds were not being given. A close relationship of the acne to male hormone treatment is attested by the rapidity with which the lesions faded when androgenic therapy was discontinued and by the fact that a regressing papule again became inflamed if treatment was resumed. The lesions are like those found at puberty. Therefore stimulation of sebaceous secretions and possibly some degree of acne of adolescence are probably not due to a "deranged metabolism" or to an "endocrine dyscrasia" but to sequelae of sexual maturation. Acne occurred in most but not all patients receiving adequate hormone therapy. The most severe eruptions were observed in a man with a history of severe acne as an adolescent. The severity of the eruption varied with the time elapsed since the sebaceous glands were stimulated and with the duration and regularity of androgenic therapy. Androgen may be involved in clinical conditions accompanied by acne, acne of puberty, adrenal virilism and arrhenoblastomas. It is suggested that the stimulation of sebaceous secretions and the adjustment between follicular secretion and excretion are primary factors in the production of acneiform lesions. Sexual hormones may also, perhaps, bear a relation to furuncular folliculitis in adolescence. The fact that androgen may induce acne in susceptible individuals is not proof that it is the sole cause of acne. Other factors and an "innate predisposition to acne" (as evidenced by identical twins) are undoubtedly of great importance.

Journal of Clinical Investigation, New York

20:333-466 (July) 1941 Partial Index

- Measurement of Sensitivity of Smallest Blood Vessels in Human Skin Responses to Graded Mechanical Stimulation in Normal Men J R Di Palma, S R M Reynolds and Frances I Foster, Brooklyn—p 333
- Blood Iodine in Patients with Thyroid Disease D S Riggs, C F Gildea, E B Man and J P Peters, New Haven Conn—p 345
- Lung Volume Under Surgical Anesthesia: Effect of Avertin on Subtidal Air G E Lindskog and A D Spicer, New Haven, Conn—p 355
- Relation of High and Low Urea Clearances to Inulin and Creatinine Clearances in Children with Nephrotic Syndrome K Emerson Jr, P H Tutcher and L E Farr, New York—p 361
- Studies on Chemical Diagnosis of Pellagra (Nicotinic Acid Deficiency) H Field Jr, D Melnick, W D Robinson and C F Wilkinson Jr, Ann Arbor, Mich—p 379
- Metabolism, Toxicity and Manner of Action of Gold Compounds Used in Treatment of Arthritis R H Freyberg, W D Block and S Levy, Ann Arbor, Mich—p 401
- Liver Lipids and Their Distribution in Disease: Analysis of Sixty Human Livers Elaine P Ralli, K Paley and S H Rubin, New York—p 413
- Studies on Blood Histamine in Patients with Allergy II Alterations in Blood Histamine in Patients with Allergic Disease B Rose, Montreal, Canada—p 419
- Magnesium Partition Studies in Graves' Disease and in Clinical and Experimental Hypothyroidism L J Soffer, C Cohn, E B Grossman, Mildred Jacobs and H Sobotka, New York—p 429

Journal of Nervous and Mental Disease, New York

93:561-700 (May) 1941

- Fulfillment of White's Purpose F A Fenning, Washington, D C—p 561
- Agensis of Corpus Callosum: Report of Case with Neuropsychiatric, Psychologic, Electroencephalographic and Pneumoencephalographic Studies L N Goldensohn, E R Clardy and Kate Levine, Orangeburg, N Y—p 567
- Psychogenic Body Image Disturbances Associated with Psychogenic Aphasia and Agnosia H A Teitelbaum, Baltimore—p 581
- Hutchinson Teeth Without Congenital Syphilis L Kerschbaumer, St Peter, Minn—p 613
- Comparative Study of Recovered and Deteriorated Schizophrenic Patients O Kant, Worcester, Mass—p 616

Journal of Neurophysiology, Springfield, Ill.

4:287-330 (June) 1941

- "Motor" Cortex of Chimpanzee J G Dusser de Barenne, H W Garol and W S McCulloch, New Haven, Conn—p 287
- Functional Interdependence of Sensory Cortex and Thalamus J G Dusser de Barenne and W S McCulloch, New Haven, Conn—p 304
- Suppression of Motor Response Obtained from Area 4 by Stimulation of Area 4s J G Dusser de Barenne and W S McCulloch, New Haven, Conn—p 311
- Functional Organization of Sensory and Adjacent Cortex of Monkey J G Dusser de Barenne, H W Garol and W S McCulloch, New Haven, Conn—p 324

4:331-426 (July) 1941

- Cerebral Blood Flow and pH in Excessive Cortical Discharge Induced by Metrazol and Electrical Stimulation H Jasper and T C Erickson, Montreal, Canada—p 333
- Relation Between Electrical Changes During Nerve Activity and Concentration of Choline Esterase D Nachmansohn, New Haven, Conn, and B Meyerhof, Woods Hole, Mass—p 348
- Nature of "Endplate Potential" in Curarized Muscle J C Eccles, B Katz and S W Kuffler, Sydney, Australia—p 362
- Isolation of Intrinsic and Motor Mechanism of Monkey's Spinal Cord Sarah Tower, D Bodian and H Howe, Baltimore—p 388
- Fibrillation in Skeletal Muscle in Relation to Denervation and to Inactivation Without Denervation Sarah Tower, H Howe and D Bodian, Baltimore—p 398
- Initiation of Muscle Impulses at Neuromuscular Junction J C Eccles and S W Kuffler, Sydney, Australia—p 402
- Human Electroencephalogram: Report of Spontaneous Electrical Potentials Obtained from Exposed Human Brain J E Scarff and W E Rahm Jr, New York—p 418

New England Journal of Medicine, Boston

225:125-170 (July 24) 1941

- *Arnold-Chiari Malformation: Diagnosis Demonstration by Intraspinal Lipiodol and Successful Surgical Treatment R D Adams, R Shatzki and W B Scoville, Boston—p 125
- *Chromic Ulcerations of Nose and Throat H Lieberman, Worcester, Mass—p 132
- Microtic, Hypochromic Anemia, Associated with Splenomegaly and Refractory to Treatment: Report of Case L P Eliel and T B Byles, Boston—p 134
- Treatment of Degenerative Joint Disease C L Short and W Bauer, Boston—p 145

Arnold-Chiari Malformation—Adams and his co-workers report 2 cases of Arnold-Chiari malformation, in 1 there was no meningocele. Clinically the patients had similar symptoms falling respectively into five types: increased intracranial pressure, cranial nerve involvement, brain stem compression, spinal cord compression and cerebellar signs. The following symptoms were manifested in each: (1) occipital headaches, vomiting, nausea and papilledema, (2) disturbances pointing to bilateral lesions of the seventh, ninth, third, tenth and twelfth cranial nerves, (3) disturbances of conjugate movements of the eyes and vertical nystagmus, (4) bilateral pyramidal tract signs and (5) gait disturbance, tremor and incoordination of movement. Some degree of platybasia is often found in the Arnold-Chiari syndrome, in all probability it is an associated congenital anomaly of the skull. Lumbar puncture and myelography were of diagnostic aid. Lumbar puncture showed a complete block in the dynamics of cerebrospinal fluid. The protein of spinal fluid was increased. The intraspinal injection of iodized oil gives an almost diagnostic picture, it outlines the bifid projection of the two herniated cerebellar hemispheres. Most operations on such patients have been unsuccessful. The patient often fails to regain consciousness or dies suddenly during convalescence, presumably from compression of the medulla. Probably the cervical spinal cord and cerebellum should be decompressed and no attempt should be made to liberate the nerve structures in the posterior fossa from the arachnoidal adhesions. Any manipulation that causes a sudden change in the spatial relations of these structures may lead to death. Both of the authors' patients survived the operation, even though more than a simple decompression was done, and continued to improve for the eighteen and six months that they were followed. Preoperative ventricular drainage was not attempted.

Chromic Ulcerations of Nose and Throat—Lieberman examined 4 men and 1 woman employed in a chromium-plating plant. Working conditions in this plant were poor, the atmosphere contained a high concentration of fumes of chromic acid. The symptoms of the patients when working over the chromate tanks consisted of an immediate attack of sneezing associated

with epiphora and a profuse watery nasal discharge. Continued close contact produced labored breathing and a choking sensation. Dizziness, weakness and dull headaches were common. After two or three months of employment nasal and postnasal discharges were thick. Heavy crusts, at times blood stained, were frequently expelled when the patients blew their noses. Two patients complained of a swollen sensation of the tongue and mouth associated with burning, soreness and dryness. The woman noticed an impairment in the sense of taste, causing all foods to taste like rubber. If food was eaten on the premises, nausea and vomiting occurred. The 5 patients had previously worked in another chromium-plating establishment, where the ventilation was adequate, and none had had any trouble. Now ulcers of various sizes and depths were present on one or both sides of the nasal septum of the 5 workers. The ulcerations were limited to the cartilaginous portion. In 3 they were relatively superficial, in 1 the perichondrium had been destroyed and the erosion exposed bare normal cartilage and in 1 there was a complete perforation measuring 6 by 4 mm. The buccal mucous membrane of the cheeks of the patient complaining of impaired taste was thickened and had a milky sheen. In 2 patients multiple small ulcers with sharply demarcated edges were present on the soft palate, the posterior surface of the tongue and the floor of the mouth. The ulcers were covered with a whitish pseudomembrane, which wiped off easily and did not bleed. Smears were negative for spirochetes and fusiform bacilli. The dorsum of the tongue was coated, dry and cracked, and many of the papillae were enlarged and red. All the patients at one time or another had suffered with "chrome holes" of the skin of the hands. These cutaneous ulcers required between four and eight weeks to heal. Local treatment consisted in cleansing the nose and postnasal space with a weak bicarbonate solution. A bland ointment was applied to the affected parts and sniffed into the nose morning and night, thus protecting the injured parts while regeneration took place. Chrome ulceration in the chromium-plating trade can be prevented by mechanical devices for the removal of generated fumes and hygienic measures among the workers. Workmen should be examined periodically and those showing signs of chrome poisoning should be suspended from work until the lesions heal.

New Jersey Medical Society Journal, Trenton

38:343-386 (July) 1941

- Regional Ileitis. H. Reich and M. Danz, Newark.—p. 347.
The Doctor as a Prescription Writer. A. P. Leighton, Portland, Maine.—p. 351.
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New York State Journal of Medicine, New York

41:1411-1506 (July 15) 1941

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Treatment of Food-Borne Diseases of Gastrointestinal Tract. Z. Berco-vitz, New York.—p. 1450.
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Present Status of Vitamins in Nervous Health and Disease. H. Worts and N. Jolliffe, New York.—p. 1461.
Feeding the German Army. M. Gerson, New York.—p. 1471.

Northwest Medicine, Seattle

40:227-264 (July) 1941

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Trochanteric Fractures of Femur. W. B. McKibbin, Seattle.—p. 242.
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Rupture of Spleen. R. L. Baker, White Salmon, Wash.—p. 250.

Surgery, Gynecology and Obstetrics, Chicago

73:129-272 (Aug.) 1941

- Histologic Diagnosis of Early Cervical Carcinoma. R. Meyer, Minneapolis.—p. 129.
Limitations of Roentgen Diagnosis of Fractures. E. Lachman, Oklahoma City.—p. 140.
Treatment of Persistent Recurrent Basal Cell Carcinoma of Face. F. Young, Rochester, N. Y.—p. 152.
*Five Year Survey of Blood Sedimentation Test in Acute Appendicitis. A. Lesser and L. R. Kaufman, New York.—p. 163.
Occurrence of Postoperative Acidosis and Pagetoid Bone Changes in Hyperparathyroidism. J. H. Couch and H. F. Robertson, Toronto, Canada.—p. 165.
Contractile Response of Human Uterus to Posterior Pituitary Extract Administered at Regular Intervals During Pregnancy: Study of Thirty-Two Patients with Lóránd Tocograph. D. P. Murphy, Philadelphia.—p. 175.
Bacterial Content of Air in Operating Rooms. T. B. Rice, L. A. Weed and H. Raidt, Indianapolis.—p. 181.
*Problem of Treatment of Peritonitis: Preliminary Report. C. E. Rea, Minneapolis.—p. 193.
Dermovascular Effects of Estrogen in Women with Menopausal Flushes. S. R. M. Reynolds, S. Kaminester, Frances I. Foster and S. Schloss, Brooklyn.—p. 206.
Diverticular Inguinal Hernia. C. C. Burton and C. Blotner, Dayton, Ohio.—p. 212.
Urinary Extravasation (Periurethral Phlegmon): Pathogenesis and Experimental Study. E. O. Finestone, New York.—p. 218.
New Factors of Clinical Significance in Study of Human Spermatozoa. J. W. Huffman, Chicago.—p. 228.
Reconstruction of Ear. J. Newman, Newark, N. J.—p. 234.
One Stage Operation for Closure of Large Defects of Lower Lip and Chin. H. May, Philadelphia.—p. 236.
Resection of Duodenum and Head of Pancreas for Carcinoma of Ampulla. T. G. Orr, Kansas City, Kan.—p. 240.
Problem of Carcinoma of Cardiac End of Stomach. J. H. Garlock, New York.—p. 244.
Priming Action of Stilbestrol on Gravid Human Uterus. A. R. Abarhanel, New York.—p. 257.
Effect of Cooling Traumatized and Potentially Infected Limbs. R. T. McElvenny, Oak Park, Ill.—p. 263.

Blood Sedimentation Test in Acute Appendicitis.

Lesser and Kaufman discuss the value of the blood sedimentation test in the diagnosis of acute appendicitis. They operated on 132 patients with a preoperative diagnosis of acute appendicitis or with primary pathologic appendiceal changes. The preoperative diagnoses in 15 cases were erroneous. Operation revealed a pathologic condition other than appendicitis. In these 15 extra-appendiceal conditions the blood sedimentation readings were consistently elevated or high, as differentiated from the normal ones of acute appendicitis. There were complicating appendiceal abscesses in 8 and in 10 cases generalizing peritonitis of varying degree and severity was found. In all instances complicated by abdominal abscess or peritonitis a consistently elevated blood sedimentation rate, varying from a high to a severe reaction, was found. In 99 cases operation confirmed the preoperative diagnoses of acute appendicitis; in 90 of these the blood sedimentation rates were 15 mm. or less in the hour and in 9 the blood sedimentation rates were above 15; the readings varied from 21 to 26 mm. in the hour. This deviation from the absolute normal may be explained by minor inaccuracies or deviations from precise detail of technic on the part of a few of the many interns called on to perform the tests. As a result of blood sedimentation readings patients with acute adnexal disease, in which operation is needless and frequently harmful, are submitted to operation less frequently.

Therapy of Peritonitis.—Rea compares the relative efficacy of certain substances in preventing peritonitis in rabbits. Animals that survived for two weeks were not killed to see if they had peritonitis. Animals that died within twenty-four hours after injection of peritonitis culture showed little evidence of peritonitis and probably died of bacteremia. The preventive substances tested were 1 per cent sodium ricinoleate, tincture of merthiolate, 2 per cent mercurochrome, hexyl-resorcinol, 0.5 and 1 per cent hydrochloric acid, cow serum, colibactragen, immune rabbit serum, amniotic fluid concentrate and sulfanilamide. At best only about a half of the animals could be protected regardless of the agent used. Of the substances used a merthiolated solution of amniotic fluid of cows (amfctin) and colibactragen were no more effective than 1 per cent sodium ricinoleate as far as survival rates were concerned. The results obtained with sulfonamides were impressive but probably no better than those obtained with sodium ricinoleate, colibactragen and the like. Sulfanilamide seemed to be most

effective in the preperitonitis stage. Also the direct application of sulfanilamide appeared more effective than subcutaneous administration or the placing of an equivalent amount of sulfanilamide powder under the skin. If frank purulent peritonitis is present, sulfanilamide not only is of little value because of inactivation by exudate protein but also may aggravate a hepatitis already caused by the peritoneal infection. Clinically sulfathiazole because it is less toxic, may prove to be more effective. In "clean" cases there is no indication for the use of any preventive agent. In clean incisions of the skin of dogs sulfanilamide affords no higher incidence of healing than that expected by primary intention. In "dirty" or grossly infected wounds sulfanilamide is valueless unless thorough debridement or cleansing is done first. In the few experiments performed, radiation therapy gave little or no protection against peritonitis in rabbits. The use of hyperimmune serum appears of value in preventing peritonitis in rabbits.

Virginia Medical Monthly, Richmond

68:437-496 (Aug.) 1941

- Medicine in Peace and War T M Greene Princeton N J—p 437
 *Spontaneous Hypoglycemia in Childhood W W Waddell Jr and T J Humphries University—p 440
 Eye Findings in Diabetes W W Taylor Norfolk—p 449
 Pulmonary Hemorrhage in Tuberculosis and Thyloquinone or Vitamin K C L Harrell Norfolk and A C Ray Lynnhaven—p 451
 Postanterior Treatment of Pulmonary Tuberculosis T B Stafford, Charlottesville—p 456
 Changes Caused by Cerebellar Neoplasms in Electroencephalogram C G Holland Charlottesville—p 459
 Problem of Psychopathic Personality in the Feebleminded Institution G B Arnold Colony—p 462
 Swallowed Air S D Blackford Charlottesville—p 469
 Pelvimetry and Its Evaluation J Berry Richmond—p 472
 Physiopathology of Uncontrolled Diabetes Mellitus H A Hoffman, Washington D C—p 475
 Leukopenia—Impressions and Review of Case Reports O O Ashworth Richmond—p 479
 Compound Fractures C J Frankel, Charlottesville—p 483

Spontaneous Hypoglycemia in Childhood—Waddell and Humphries encountered 6 cases of spontaneous hypoglycemia in children within a period of two and a half years in their pediatric service, which is not large, suggesting that the condition is not rare. Looking back over their experience they are confident that other fatal instances of the condition were present but not diagnosed. Failure to recognize and to treat adequately severe and spontaneous hypoglycemia no doubt is the answer to some deaths shown on hospital records as convulsions of unknown cause. The diagnosis of severe hypoglycemia is not difficult and can be made from symptoms and signs alone even by those of limited experience. The diagnosis must be verified, if possible, by fasting blood sugar determinations, five to six hour dextrose and insulin tolerance curves. One should never fail to make blood sugar determinations in any case of unexplained unconsciousness and persistent convulsions. Where the breakdown in carbohydrate metabolism occurs is difficult to determine, perhaps in many instances more than one etiologic factor is operative. Treatment of severe spontaneous hypoglycemia consists in oral and parenteral administration of dextrose and, if proper mobilization of glycogen is not occurring, epinephrine is a valuable adjunct. Response to therapy, when it occurs, is usually prompt and gratifying, the patient frequently regains consciousness within a few minutes. This is not true of all patients, the mere finding of hypoglycemia does not always mean that it is the cause of the presenting symptoms. Pancreatic tumors necessitating operation are rare in children. Before a child with hypoglycemia is subjected to such a procedure the following criteria should be established: proof of more or less persistent or frequently recurring hypoglycemia, relief of symptoms by dextrose intravenously and the inability to relieve symptoms by diet regulation, in recurrent attacks of hypoglycemia with normal intervening intervals, intolerance or hypersensitivity to insulin should be shown. Two of the authors' patients died without showing the usual response to therapy. This emphasizes the occasional serious nature of the condition. An apparent relationship appeared to exist between acute accidental alcohol poisoning and hypoglycemia in 1 of the children.

Yale Journal of Biology and Medicine, New Haven

13:429-562 (March) 1941

- Joseph Strong, M D, Yale 1788 Army Surgeon, Inventor, Practitioner of Physic L Barr, New York—p 429
 Surgical Production of Collateral Intracranial Circulation Experimental Study W J German and M Taffel, New Haven, Conn—p 451
 Local Action of Estrone on Mammary Glands of Mice W U Gardner, New Haven Conn, and F L Chamberlin New York—p 461
 Torula Infection L J Wade, New Haven, Conn, and L D Stevenson, New York—p 467
 Effect of Local Freezing on Electrical Activity of Cerebral Cortex L F Nims, C Marshall and A Nielsen New Haven, Conn—p 477
 Chemical Changes in Cerebral Cortex Following Local Thromboembolism and Local Freezing C Marshall, L F Nims and W E Stone New Haven, Conn—p 485
 Stenosis of Esophagus in Four Generations of Mice of the NH Strain L C Strong and G M Smith New Haven, Conn—p 489
 *Potassium Thiocyanate in Treatment of Hypertension L F Blaney, A J Geiger, New Haven, Conn, and R G Ernst, Hartford, Conn—p 493
 Aids for Optical Analysis of Electrophoretic Diagrams A G Stern and D DuBois New Haven, Conn—p 509
 Studies of Regression in Transplantable Tumor in Mice H Bunting, New Haven Conn—p 513
 Effects of Potassium Deficiency on Tumor Bearing Mice A A Liebow, W J McFarland and R Tennant, New Haven, Conn—p 523
 Observations on Absorption, Excretion, Diffusion and Acetylation of Sulfidiazine in Man J F Sadusk Jr and J B Tredway New Haven, Conn—p 539

Potassium Thiocyanate for Hypertension—After a control period on placebos Blaney and his collaborators used potassium thiocyanate for 20 patients with pronounced arterial hypertension of a duration of from one to ten years. The patients were usually given orally 1 teaspoon of a 4 per cent solution of potassium thiocyanate in syrup of sarsaparilla three times a day. This was equivalent to a daily dose of 0.5 Gm of the drug and was continued until the concentration of serum thiocyanate was from 8 to 12 mg, as suggested by Barker. Maintenance doses were thereafter adjusted for the individual as indicated by subsequent blood analyses. Periods of thiocyanate and placebo medication, usually for several months, were alternated without the patient's knowledge. This was facilitated by using either a 50 per cent syrup of sarsaparilla or syrup of wild cherry both as a placebo and as a vehicle for the thiocyanate. No other treatment or advice was given, and the patients followed their customary mode of living. The blood pressure of 4 patients dropped to normal during thiocyanate medication and rose again when the drug was withheld. A relatively severe hypertension of 6 patients seemed significantly ameliorated but not completely alleviated during periods of thiocyanate administration, again, the blood pressure rose when the medication was stopped. In 4 patients the blood pressure levels varied considerably, but the relation to thiocyanate medication was not clear. In 6 patients there was no apparent alteration of the blood pressure levels during thiocyanate medication when viewed against proper control periods of observation. Therefore half of the patients appeared to respond to thiocyanate medication with a complete or partial remission of their hypertension. Four patients had no symptoms before, during or after treatment, 8 probably felt improved during thiocyanate therapy (in 4 of these the hypertension was not lowered) and the symptoms of 8 patients were not relieved, although in 3 of them the blood pressure fell appreciably but not to normal. A few patients felt worse during part of the thiocyanate course. It appears that under thiocyanate therapy the probability of symptomatic improvement is greater if the blood pressure falls. No objective evidence of injury from the treatment, as indicated by the renal or cardiac functional status, eyegrounds and electrocardiograms, was encountered in those patients whose hypertension was appreciably diminished. The average daily maintenance dose for the 20 patients approximated 0.5 Gm of potassium thiocyanate, but individual needs varied from 0.16 to 0.64 Gm. In general, the dosage of patients with impaired renal function was smaller than of patients with apparently normal renal function, but other contributing factors may have existed. Significant hypotensive effects in patients showing complete or partial alleviation of their hypertension were observed occasionally at serum levels as low as 4 and 6 mg per hundred cubic centimeters, but optimal effects were most commonly associated with concentrations of from 8 to 15 mg. Some of the manifestations attributed to intoxication with thiocyanate salts are lassitude, anorexia, nausea, vertigo and weak-

ness. However, these symptoms were common among the patients in the absence of thiocyanate medication. When only those symptoms which appeared for the first time during thiocyanate therapy are considered, it is found that a macular eruption with pruritus localized to the back occurred once, anemia once (perhaps the result of bleeding hemorrhoids), nausea three times, diarrhea twice, marked ulnar palsy once, pain in the jaws and teeth twice, symptoms of infection of the upper part of the respiratory tract three times and pronounced lassitude and drowsiness four times. These presumably toxic manifestations (with one exception, a concentration of 6.6 mg.) were all associated with serum thiocyanate concentrations between 15.7 and 21 mg. per hundred cubic centimeters. There were numerous occasions when no untoward effects appeared in patients whose serum thiocyanate concentrations at times inadvertently rose to from 15 to 33 mg.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:1-38 (July 5) 1941

*Treatment of Burns and Wounds by Envelop Method. J. Bunyan.—p. 1.

*Wounds and Burns Treated by Coated Silk Fabric: Report on and Conclusions Drawn from Treatment of Eighty-Two Cases. R. V. Hudson.—p. 7.

Value of Nonspecific Factor in Experimental Immunization with Influenza Virus. J. Ungar and R. F. Hunwicke.—p. 12.

Control of Gastric Hyperacidity in Peptic Ulcer. W. E. Smith.—p. 13.

Treatment of Burns and Wounds by Envelop Method.—Bunyan describes a method of treating burns by means of a watertight coated silk envelop. The envelops have inlets and outlets making it possible to irrigate any part of the body by inserting a glass nozzle into one of the openings. For first aid treatment packs of 1 per cent electrolyte sodium hypochlorite are applied to the burn. First degree burns may be bathed in a 50 per cent solution for ten minutes, after which the concentration is lowered to 10 per cent for ten minutes. The area is dried and is covered with adhesive plaster. A patient with a second or third degree burn is premedicated and anesthetized. If the blisters are unbroken, the area is washed with 20 per cent electrolyte sodium hypochlorite at 100 F. The blisters are then aspirated and some 10 per cent electrolyte sodium hypochlorite injected into them, left in for five minutes, withdrawn by syringe and needle and the skin pressed down flat with a dry dressing. When the skin is broken, necrotic tissue should be cut away under a stream of electrolyte sodium hypochlorite, bathed for ten minutes in a 10 per cent solution, covered with a sheet of the special coated silk and sealed at the edges. After a suitable envelop is applied it is inflated with oxygen and the inlets are sealed. Routine irrigation begins the next day: 5 per cent electrolyte sodium hypochlorite is employed at 100 F. and is run through the envelop over the affected area or areas for twenty minutes. This procedure is carried out three times a day. After irrigation and drainage for half an hour, the envelop is inflated with oxygen. For third degree burns of the extremities a bath is filled with electrolyte sodium hypochlorite solution up to a concentration of 20 per cent. A jet from a Higginson syringe is used to scour-irrigate the affected area. After necrotic skin is removed almost to the margin of the burn, the area should be syringed until spontaneous hemorrhage takes place and the burned area becomes covered with a firm shiny fibrin coagulum. The burned area is then covered with coated silk sheeting, the envelop is slipped over the sheeting, the latter is withdrawn, the normal skin beneath the seal of the envelop is dried with ether methyl, oxygen is run in and the inlets are sealed. Irrigation is maintained three times a day. When the face and head are burned the initial cleansing is done in the usual manner, except that a 10 per cent solution is sprayed on through a vulcanite hose, with the patient's head over a basin. A cylindric envelop with slits for eyes, mouth and nostrils is then applied. If burns of the limbs are complicated by compound fractures they are treated as described and splinting is applied outside the envelop. The method lends itself to treating septic fingers, infected tendon sheaths, cellulitis, osteomyelitis, varicose and trophic ulcerations and dermatitis. The prelimi-

nary irrigation rapidly cleans the injured area, the patient feels little or no pain during the irrigation and is usually comfortable afterward, edema is often visibly reduced during the washing, excessive exudation ceases, primary shock is not aggravated, tissue and bacterial toxemia are controlled, the temperature and pulse become normal quickly and lesions heal rapidly. Movement is encouraged. If epithelization is slow, short wave therapy may accelerate it. The new skin over damaged areas, as in third degree burns, is of sound and well vascularized quality. Failure to heal because of secondary infection will not be a factor with the envelop method of treating burns.

Envelop Treatment of Wounds and Burns.—Hudson used the coated silk envelop method of Bunyan for the treatment of 82 wounds or burns showing ulceration and/or infection. The 60 patients whose treatment has been completed had primary and secondary burns, ulcers and gangrene, severe lacerating wounds (including compound fractures) and acute pyogenic lesions. Irrigations for clean wounds were given morning and evening, and for dirty wounds at least three times a day. The average duration of the irrigation was ten minutes, and the temperature a constant 100 F. The strength of the solution was 5 per cent of the 1 per cent stable electrolytic sodium hypochlorite in tap water; this was reduced to 2.5 per cent if the patient had any discomfort or manifested a dermatitis, and as a routine when the wound became clean. Treatment was continued until the wound was healed or ready for primary suture or cutaneous grafting. Strict attention was paid to the treatment of shock, the prophylactic use of sulfanilamide compounds, surgical toilet and constitutional and rehabilitation therapy. Of the 26 cases of ulcer and gangrene treated, all but 1 Meleney ulcer were benefited. A perforated ulcer of the foot of a tabetic patient complicated by cellulitis healed in three weeks. In certain cases of mutilating injuries with ingrained oil and dirt, amputation was avoided and some function preserved by this method. In infected compound fractures with loss of substance, deodorization and practical disinfection, with healing and union, were brought about. When traction was necessary the apparatus was placed inside or outside the envelop. The results of the envelop method in the treatment of 14 instances of acute pyogenic lesions were good. Maceration and edema did not occur. If the drainage was not adequate, the slight drying action of the electrolytic sodium hypochlorite enabled pockets of pus to collect which necessitated further drainage. The author's conclusions bear out those of Bunyan. As an adjunct the sulfonamide drugs orally, parenterally and locally have been of inestimable value. The method appears applicable as a first aid and treatment measure for service, civilian and factory burns and wounds.

Lancet, London

2:1-30 (July 5) 1941

Principle in Raspberry Leaves Which Relaxes Uterine Muscles. J. H. Burn and E. R. Withell.—p. 1.

*Early Results of Prefrontal Leukotomy. E. Lilian Hutton, G. W. T. H. Fleming and F. E. Fox.—p. 3.

*Surgical Treatment of Mental Diseases. J. S. McGregor and J. R. Crumie.—p. 7.

Sulfathiazole and Sulfapyridine in Acute Gonorrhoea. H. B. Jones and R. W. Fairbrother.—p. 9.

Improved Apparatus for Continuous Intravenous Anesthesia. R. R. Macintosh and E. A. Pask.—p. 10.

McArthur Hernioplasty. C. R. McLaughlin.—p. 11.

2:31-60 (July 12) 1941

Somatic Factors Conditioning Air Raid Reactions. H. Creighton-Miller.—p. 31.

Di-Iodotyrosine in Treatment of Graves's Disease. S. H. Wass.—p. 34.

Diabetes Mellitus in Addison's Disease. E. G. G. Rhind and A. Wilson.—p. 37.

Pain in Acute Appendicitis. R. Clarke and M. Shapiro.—p. 39.

Prefrontal Leukotomy.—According to Hutton and her colleagues, prefrontal leukotomy was performed on 8 of their schizophrenic or manic-depressive patients with a bad or hopeless prognosis. Other methods of treatment had been without benefit, so that any improvement following the operation was attributed to it. Only eighteen months have elapsed since the first operation was done, but 2 schizophrenic patients and 1 manic-depressive patient have shown great improvement, 1 manic-depressive patient has shown some improvement, 3 schizo-

phrenic patients have so far shown little improvement and 1 patient died from myocardial fibrosis and atheromatous coronary arteries. Operation was followed by bed wetting in 4 cases; in 3 it has persisted sporadically for some months. The operation appears to be ideal for the patient with suicidal ideas and apprehension.

Surgical Treatment of Mental Diseases.—McGregor and Crumbie performed leukotomy on 4 patients: 1 with melancholia, 2 with schizophrenia and 1 with delusional insanity. Following the surgical intervention the patient with melancholia and 1 with schizophrenia have experienced great mental improvement, the other with schizophrenia is slightly improved and the 1 with delusional insanity was much improved mentally but died from bronchopneumonia on the eleventh postoperative day. The author believes that the method deserves further trial.

Medical Journal of Australia, Sydney

2:1-22 (July 5) 1941

- *Acute Hemorrhagic Leukoencephalitis: Previously Undefined Entity. E. W. Hurst.—p. 1.
Pycelography After Subcutaneous Injection of Dye. H. Mortensen.—p. 6.

2:23-48 (July 12) 1941

- Mass Radiography of Thorax, with Special Reference to Its Application to Recruits for the Army. B. White.—p. 23.
Mass Radiography of Chest. B. P. A. Stuart.—p. 27.
Changing Scene in Medicine: Van Diemen's Land, 1803 to 1853. W. E. L. H. Crowther.—p. 29.

2:49-72 (July 19) 1941

- Studies in Tuberculosis: II. Relative Incidence of Human and Bovine Types of Mycobacterium Tuberculosis in Human Disease in Victoria. R. Webster.—p. 49.
Remarks and Observations on Etiology and Diagnosis of Renal Calculi. A. C. McEachern.—p. 55.

2:73-102 (July 26) 1941

- Changes in Lungs in Various Industries. J. G. Edwards.—p. 73.
Pulmonary Tuberculosis and Pregnancy. H. B. Oxenham.—p. 77.
Isolation of New Species of Dysentery Bacillus. S. D. Rubbo.—p. 81.
Reflections on Operative Treatment of Glaucoma. E. T. Smith.—p. 83.

Hemorrhagic Leukoencephalitis.—Hurst discusses an undefined entity that he had encountered in 2 cases and verified post mortem. The disease is an acute cerebral condition termed acute hemorrhagic leukoencephalitis. It is localized in the cerebral white matter and develops more or less abruptly in apparently normal persons. Perivascular necroses, perivascular and focal demyelination, hemorrhages, edema and cellular infiltration were the chief pathologic changes. The principal clinical features were rapid abrogation of the higher cerebral functions in previously healthy persons associated with headache, vomiting, slight pyrexia or leukocytosis. Identical cerebral lesions were found at necropsy of the 2 patients. The highly hemorrhagic and edematous state was localized chiefly in the white matter of the left hemisphere. Subsequent microscopic examination revealed lesions independent of and associated with hemorrhages and edema. They included important damage to the vascular, perivascular and intervascular tissues. There was no clearcut vascular thrombosis. Often the vascular walls were permeated by and their perivascular spaces distended with fibrin. In the nervous tissue surrounding venules and precapillaries the lesions were either of partial demyelination with some outfall of axis cylinders or of changes leading up to necrosis. The association of the former with obviously less severely affected vessels situated at a distance from the most damaged areas suggest different degrees of injury by a single noxious agent. A few foci of partial demyelination apparently occurred independently of a vessel. The intense polymorphonuclear infiltration in the perivascular spaces and in the nervous tissues bore witness to the acuteness and severity of the condition. The changes suggest an acute demyelinating disease such as post-vaccinal encephalitis rather than a virus malady characterized by a polioclastic type of lesion. The brains were received fixed in formaldehyde-saline solution. No organisms were seen in stained sections. The author compares the lesions in his 2 cases with those encountered in brain purpura and in Baker's hemorrhagic encephalitis. He suggests that acute hemorrhagic leukoencephalitis may represent a link between demyelinating diseases and some forms of "hemorrhagic encephalitis."

Monatsschrift für Geburtshilfe und Gynäkologie, Basel

111:1-120 (Aug.) 1940

- *Hypoprothrombinemia and Hemorrhagic Diathesis of the Newborn and Its Relations to Vitamin K. N. Fiechter.—p. 1.
Investigations on Body Temperature of Women in Correlation to Phases of Genital Cycle. Ursula Vollmann.—p. 41.
4.4 Dioxy-Alpha-Beta Diethylstilbene (Stilbestrol), a Synthetic Compound with Action Resembling Estrogenic Hormone. C. A. Joël.—p. 63.

Hypoprothrombinemia in the Newborn and Vitamin K.—Fiechter states that with the aid of a new micromethod based on the principle of Quick's method, but requiring only 0.13 cc. of capillary blood, it is possible to demonstrate a physiologic retardation of the clotting time due to a prothrombin deficiency during the first week of life. This transient disturbance in the clotting time exists at birth in a slight degree and reaches its maximum between the third and fifth days of life. This retardation of the clotting time of the newborn can be prevented either by giving vitamin K to the pregnant woman or by administering it to the newborn. In hemorrhagic diathesis of the newborn, which coincides with the physiologic hypoprothrombinemia, the clotting time is likewise prolonged. It can be influenced by vitamin K, which arrests a manifest hemorrhage. In cases of melena neonatorum observed by the author, vitamin K replaced blood transfusion. The delay in clotting time observed in cases of severe jaundice was likewise favorably influenced by vitamin K. In one case subcutaneous bleedings could be arrested. Hypoprothrombinemia of the newborn is probably due to a K hypovitaminosis and to an insufficiently developed function of the hepatic cells.

Schweizerische medizinische Wochenschrift, Basel

71:633-652 (May 17) 1941. Partial Index

- Present Day Tendencies in Bacteriology. P. Hauduroy.—p. 633.
*Stenosis of Aortic Isthmus as Pathologic-Physiologic Problem. W. Löffler and W. R. Hess.—p. 636.
Anomaly in Location of Aorta: On the Right Side and Behind the Esophagus. R. Humbert.—p. 640.
*Prophylaxis of Diphtheria. E. Traub.—p. 641.

Stenosis of Aortic Isthmus.—Löffler and Hess report the case of a man in whom a cardiac defect was discovered at the age of 13. Examination at the age of 25 disclosed a stenosis of the aortic isthmus. The patient felt well and remained comparatively well for the following ten years. Subsequently he had frequent "colds," which in all probability were manifestations of pulmonary stasis, the first sign of circulatory insufficiency. The patient died at the age of 43, eighteen years after the stenosis had been recognized. Stenosis at the isthmus leads, as a rule, to complete obliteration of the aorta beyond the branching off of the large vessels for the upper part of the body. By this obliteration at the transition of the arch into the descending aorta the body is virtually divided into two peripheral circulatory regions with entirely different blood perfusion. The upper half of the body inclusive of the coronary system maintains its normal relation to the heart, whereas the lower half has been deprived of its main source of perfusion, the aorta, and requires a number of compensatory mechanisms to insure adequate blood supply. This case, as well as others reported in the literature, indicates that a person with stenosis of the aortic isthmus can live for years with a compensated circulation. In the case described cardiac function had already become adjusted to the demands of the periphery when the man first came under the authors' observation. There was cardiac hypertrophy, hypertension in the proximal portion of the arterial system, adequate pressure in the distal portion and collateral circulation. Such instances demonstrate an astounding capacity of the cardiac muscle for compensation. The authors warn, however, against excessive optimism in the prognosis of such cases.

Prophylaxis of Diphtheria.—Traub compared the clinical course of diphtheria in immunized and nonimmunized children. His observations were made on 2,775 occupants of the children's hospital in Brunn from November 1934 to July 1938. He found that the course of diphtheria was considerably milder in the immunized children. The mortality was only one-third that of the nonimmunized, and the incidence of the malignant type

of diphtheria was less than one-half that in the nonimmunized. Mortality in the severe type was likewise much less in the immunized than in the nonimmunized. The author defends and urges the practice of prophylactic immunization against diphtheria.

Note e Riviste di Psichiatria, Pesaro

70:1-120 (Jan.-March) 1941. Partial Index

*Blood in Dementia Paralytica After Malaria Therapy. I. Passanisi.—p. 37.

Blood in Dementia Paralytica.—Passanisi observed the behavior of blood in eight patients with dementia paralytica of from two to eight months' duration, before and after malarial therapy. He found that paralytic anemia, and especially hypoglobulia, is aggravated by malarial therapy and that postmalarial hypoglobulia can be controlled by daily administration of liver extract for twenty consecutive days.

Policlinico, Rome

47:1739-1786 (Oct. 21) 1940. Prac. Sec. Partial Index

*Estrogen in Therapy of Hemorrhages. F. Patrignani.—p. 1739.

*Therapy of Open Fractures. E. Agostinelli.—p. 1742.

Estrogen for Hemorrhages.—Patrignani obtained good results from injections of estrogen in 13 cases of tuberculous and nontuberculous hemoptysis. Best results were obtained from highly concentrated estrogen (estradiol benzoate). The control of hemorrhage was rapid and permanent.

Therapy of Compound Fractures.—Agostinelli advises against primary suture of the wound in compound fractures, especially in war. He reports good results from primary treatment of the wound followed by reduction and immobilization. The wound is cleansed, and carefully disinfected, and the marginal tissues are cut away. The fracture is reduced, and a cast with a window and continuous traction by means of weights are applied. Gauze compresses soaked in cod liver oil are applied every other day to the wound. A preparation of ascorbic acid and calcium is administered in the course of the treatment. Early active mobilization is applied to the joint of the fractured limb. The author believes that this treatment prevents infection and stimulates rapid healing of the wound.

Prensa Médica Argentina, Buenos Aires

28:1247-1298 (June 11) 1941. Partial Index

*Pellagra and Its Therapy. C. Pinedo.—p. 1281.

Pellagra.—According to Pinedo, pellagra is rare in Argentina. Lesions involve the mucous membranes of the digestive tract from mouth to anus, the skin, the brain, the spinal cord and the nerves. Mental disorders and blood dyscrasias are present. Neurologic symptoms vary with the localization of degenerative processes in the nervous system. The disease is mainly due to hypovitaminosis B. It is curable except in advanced stages. Hygiene is of importance. The treatment consists of a diet of plenty of milk, 3 spoons of yeast in milk daily, eggs, meat, fresh vegetables and fruit. If glossitis makes eating difficult, abundant milk, yeast and fruit juices are given for about one week, after which the full diet is resumed. In moderately grave cases the treatment is complemented by daily administration of fractional doses of 30 or 50 mg. of nicotinic acid up to a daily dose of 300 or 500 mg. of nicotinic acid and of large doses of vitamin B. Both may be administered orally or parenterally. Liver and iron are indicated in pellagra with either hypochromic or macrocytic anemia. Residual paralysis and mental impairment are preventable if the treatment is administered early in the course of the disease when nervous lesions are still reversible.

Revista de Cirugía de Buenos Aires

20:143-192 (April) 1941. Partial Index

*Treatment of Chronic Osteomyelitis. A. Gutiérrez.—p. 143.

Treatment of Chronic Osteomyelitis.—Gutiérrez's treatment consists of filling the medullary canal of the involved bone with a muscular flap. Trauma of muscles and nerves is avoided as much as possible. The medullary canal is opened by trephining, is carefully cleansed and is filled with the flap, which is

left in position by means of three or four catgut sutures and covered with adjacent muscle and skin. The deltoid muscle is used to fill the medullary cavity of the upper part of the humerus, and the anterior brachial to fill that of the lower half of the bone. Both muscles are used for the upper and lower halves of the humerus in diffuse, bipolar humeral osteomyelitis. The crural muscle covered by the vastus externus muscle is utilized in osteomyelitis of the femur, and the anterior tibial in osteomyelitis of the tibia. The blood supply of the flaps is preserved so that the flaps do not undergo necrosis. The author believes the method to be of great value.

Archiv für klinische Chirurgie, Berlin

201:109-338 (April) 1941

*Circulation and Spinal Anesthesia. D. Schneider.—p. 109.

Experimental Investigations on Torsion of Omentum. O. Hatta.—p. 163.

Experimental Investigations on Suppurating Infection of Femur and Tibia in Guinea Pigs. M. Suzuki.—p. 192.

Juvenile Kyphosis of Scheuermann in Light of Formation of Cartilage Callus. S. Nagura.—p. 232.

Investigations on Postoperative Changes of Minute Volume of Heart. S. Harild.—p. 249.

Experiences in Treatment of Appendicitis Perforata. H. Nahrath.—p. 293.

Surgical Results in Malignant Tumors. J. Klemp.—p. 320.

Pathogenesis of Perthes' Disease. S. Nagura.—p. 334.

Circulation and Spinal Anesthesia.—Experiments convinced Schneider that fatalities in spinal anesthesia are frequently the result of circulatory failure. He found that spinal anesthesia leads to a considerable disturbance in the blood distribution, brought about by vascular paralysis in the anesthetized region. The paralysis involves not only the arteries but also the veins. This is the main cause of the fall in blood pressure during spinal anesthesia. The stagnation of large quantities of blood in the periphery, however, does not alone produce circulatory failure. At first there appears a collapse-like condition. Great reduction in pressure and a true collapse develop only when (1) the "autogenous hemorrhage" becomes too great because the vascular paralysis involves large areas, (2) when the organism requires greater circulatory exertion of a regulatory nature or because of a great loss of blood and (3) when because of the failure of normal regulatory processes a compensatory adjustment is no longer possible. The abolishment of certain reflexes originating in the carotid sinus, the failure of the central nervous carbon dioxide regulation and the impairment of the nervous regulation of venous return play important parts, but all are in the last analysis sequels of the chief cause; namely, the vascular paralysis. This is further aggravated by the reduction in the muscle tonus due to paralysis of motor nerves. This factor likewise retards the venous blood return and thus completes the vicious circle. A change in the distribution of blood, the result of paralysis of extensive vascular regions, is the chief cause of the circulatory failure in spinal anesthesia. Studies by the author revealed that the paralysis involves chiefly the vessels of the skin and muscles of the trunk and legs and that the splanchnic region is involved to a much less extent. The author's observations are supported by therapeutic experiments. It was found that because of the stasis in the peripheral circulation the central analeptics and carbon dioxide not only do not help but may actually be harmful. Collapse during spinal anesthesia calls for circulatory stimulants with a peripheral effect. Stimulants which facilitate venous return and emptying of the storage organs are preferable to drugs causing constriction. Transfusions and infusions are valuable as adjuvants during spinal anesthesia.

Chirurg, Berlin

13:225-272 (April 15) 1941. Partial Index

Leg Splints. M. Kirschner.—p. 225.

*Question of Frequency of Acute Appendicitis. G. Petró.—p. 236.

Technic of Plastic Interventions on Renal Pelvis and Ureter in Hydro-nephrosis. H. Boemlinghaus.—p. 244.

Strumectomy Without Drain. M. Saegesser.—p. 261.

Frequency of Acute Appendicitis.—Petró found that during the last five years the average annual number of cases of acute appendicitis in three cities in southwestern Sweden was between 0.23 and 0.24 per cent of their total population. Appendicitis was somewhat more frequent among men (0.26 per cent)

than among women (0.20 per cent); the age group between 15 and 30 had the highest morbidity (0.39 per cent). Petré compared the averages of the last five years with those he had obtained in two of the cities thirty years ago. In the city with the largest population the morbidity figures had remained identical, whereas in the smaller city there was an increase. However, the author concludes that in view of possible sources of error it is not justified to conclude that the incidence of appendicitis has really increased. Quensel used the same statistics to determine what percentage of the population of the three cities will have had appendicitis at different age levels and what percentage will contract it throughout life. He ascertained that up to 10 years of age 1.60 per cent of the males and 1.25 per cent of the females will have had appendicitis, up to 20 years 5.20 and 4.50, up to 30 years 8.60 and 7.55, up to 40 years 11.20 and 9.35, up to 50 years 12.90 and 10.20, up to 60 years 14.20 and 11.30, up to 70 years 15.50 and 12.30. Throughout the whole life span 13.8 per cent of the men and 11.1 per cent of the women will have appendicitis, or 12.5 per cent of the total population.

Deutsche medizinische Wochenschrift, Leipzig

67:417-454 (April 18) 1941. Partial Index

- Defense Against Infection and Sympathetic Nervous System. F. Hoff.—p. 417.
Importance of Vitamins for Natural Defense Powers of Organism. H. Schroeder.—p. 420.
Morphologic Course of Infectious Diseases and Its Relation to Clinical Aspects. S. Graff.—p. 424.
Parenchymatous Icterus. M. Bürger.—p. 427.
*Spontaneous Hypoglycemia and Hypophysis. F. Meythaler.—p. 433.
Hypoglycemia as Symptom of Hypophysial Diseases. J. Brinck.—p. 437.
Prognosis of Nephrotic Disturbances of Kidney. S. Litzner.—p. 440.

Spontaneous Hypoglycemia and Hypophysis.—Meythaler believes that the function of the liver in the intermediary carbohydrate metabolism with its dependence on the neurohormonal regulation by the diencephalohypophysial system and the incretory glands is responsible for the disturbances in the regulation and equilibrium which lead to spontaneous hypoglycemia. He presents the history of a woman aged 46 who for six years had been subject to attacks characterized by a feeling of weakness, loss of memory, fainting and somnolence. The attacks occurred as a rule before the noon meal. A severe hypoglycemia was discovered to be the cause of these attacks. The author attempts to prove that the severe spontaneous hypoglycemia in this case was due to a relative hyperinsulinism, which in turn developed because of a hormonal correlation disturbance between the diencephalohypophysial system and the other secretory glands. The eliciting factor of the hypoglycemia was the hypofunctioning of the anterior lobe of the hypophysis, which in turn was the sequel of many years of excessive demands on this organ following early total extirpation of the uterus and its adnexa (age of 23). By the time the woman reached the period of the physiologic climacteric, the anterior hypophysis was so exhausted that the pancreas became dominating.

Fortschritte a. d. Gebiete der Röntgenstrahlen, Leipzig

63:247-310 (May) 1941

- *Perthes' Disease as Manifestation of Wear and Tear Reaction of Skeleton and Its Differentiation from Various Epiphysal Disturbances. W. Müller.—p. 247.
Technic of Bronchography and Diagnosis of Bronchial Carcinoma. K.-H. Krohn and W. Baer.—p. 267.
Study of Cardiac Shadow in Roentgen Screen Photography. M. Dimitrow.—p. 285.
Vertebral Changes in Tumors of Spinal Cord. E. G. Mayer.—p. 293.
Roentgenologically Diagnosed Diverticulum of the Vermiform Appendix. G. Somogyi.—p. 299.
Ball Shaped Pad Effect at Duodenal Bulb as Symptom of Carcinoma of Head of Pancreas. J. Bückner.—p. 303.

Perthes' Disease.—Müller states that roentgenologically detected changes in the head of the femur during the period of growth are often grouped together under the term "Perthes' heads." He emphasizes that these changes are not always the result of the same process and that this indiscriminate grouping together of different lesions is one of the reasons why the

nature of Perthes' disease is still obscure. He was able to observe the appearance and course of Perthes' disease in a case of manifest skeletal inferiority with zones of transformation and wear reactions on the tibias but with initially normal hip joints. This disease is apparently a manifestation of a general inadequacy of the osseous parts of the hip joint. The changes in the epiphysis are neither the only nor the primary defect but are rather a partial manifestation of a deep seated transformation observable chiefly in the neck of the femur in the form of structural changes broadening by periosteal addition and of pictures resembling those of Schmorl's cartilaginous nodules of the vertebral column. These transformations in the neck of the femur lead to changes in the epiphysis. The flattening of the acetabulum is likewise a partial manifestation of the transformation and not a cause or a sequel of the epiphysal changes. In view of the transformations, particularly in the acetabulum and the femoral neck, true Perthes' disease is to be differentiated from the Perthes-like pictures of the hip, particularly from (1) the simple primary destruction of the epiphysis in reduced or unreduced congenital dislocation of the hip and (2) from the congenital inhibitions of the epiphysal ossification, which are hereditary and of which several types have been observed. True Perthes' disease is a partial manifestation of a generalized skeletal inadequacy. It presents in the particularly exposed hip joint the manifestation of the same processes of functional adjustment that are known as processes of transformation of the tubular bones and other severely taxed skeletal parts.

Klinische Wochenschrift, Berlin

20:305-328 (March 29) 1941. Partial Index

- Question of Development of Substance Stimulating Respiration During Muscular Exertion. K. Kramer and O. Gauer.—p. 309.
Active Substances in Mistletoe: Their Pharmacologic and Clinical Significance. A. Enders, O. Feuchtinger and S. Janssen.—p. 311.
Investigations on Occurrence of Plasma Cells in Experimental Hyperglobulinemia in Rabbits. M. Björneboe and H. Gornsen.—p. 314.
*Aspects of Carcinoids of Appendix. H. C. à Wengen.—p. 316.
*Differential Diagnostic Value of Aspects of Cerebrospinal Fluid in Sciatica. L. Příbék.—p. 320.

Carcinoid of the Appendix.—According to à Wengen, carcinoids of the appendix are known under such terms as tumors of the appendix, basal cell cancers, basalomas, carcinoid tumors, pseudocarcinomas, mucosal nevi, pancreatic tumors and endocrine tumors. The term carcinoid is used widely. He reviews 18 cases of carcinoid of the appendix observed at the surgical clinic in Basel from 1934 to 1940. Carcinoids are yellowish white dense formations which vary in size from a millet seed to a cherry, although in one of his cases the carcinoid was twice the size of a fist. They originate in the wall of the appendix and may infiltrate inward or outward. The majority of the carcinoids are diagnosed by microscopic examination. As a rule they escape clinical diagnosis and are discovered in the course of an operation or at necropsy. Carcinoids are epithelial neoplasms. The fact that they produce no metastases, as a rule, proves their relatively benign character, but they may manifest signs of a malignant condition. Metastases may be observed in the proximal lymph nodes, the mesenterium, the mesentery and peritoneum and even in the more distant organs such as the liver and ovaries. Metastasis is the only macroscopic sign by which malignant carcinoids can be differentiated from the benign. The author observed metastases among his own cases. Carcinoids are often regarded as hamartoma-like tumors and as originating from an anlage of accessory pancreatic tissue. Other etiologic theories stress the chromaffinity and argentaffinity of the carcinoid cells and suggest a relationship to the adrenals or to the endocrine organs in general. Appendectomy is an adequate treatment, but in the presence of metastases the operation must be as radical as possible. Postoperative roentgen therapy is unnecessary in the benign, and influences only isolated metastases in the malignant, carcinoids.

Cerebrospinal Fluid in Sciatica.—Příbék points out that it is often difficult to differentiate sciatica from lumbago or muscular rheumatism. Differentiation of sciatica demands careful physical examination, roentgenoscopy of the vertebral

column in different exposures, myelography observation on the cutaneous temperature, and examination of the cerebrospinal fluid. Thermo electrical determination of the cutaneous temperature in various regions of the course of the sciatic nerve permits differentiation between lumbago and sciatica, because in sciatica the temperature of the diseased side is from 0.3 to 0.5 degree C. (0.54 to 0.9 degree F.) lower than that of the healthy side, while in lumbago the temperature is the same on the two sides. The author performed spinal puncture and examination of the fluid in 20 cases. The pressure of the fluid varied in different disorders. In muscular rheumatism it was between 12 and 15 cm. of water; in lumbago it averaged 15 cm. and in sciatica 21 cm. The number of cells was increased in sciatica, even if the fluid was clear. The total protein and the sugar content were usually increased in sciatica. The cerebrospinal fluid of patients with lumbago or muscular rheumatism was usually normal.

Medizinische Klinik, Berlin

37:397-428 (April 18) 1941. Partial Index

- Diagnosis and Treatment of Catarrhal Icterus. R. Schoen.—p. 397.
Acute Impairment of Hepatic Parenchyma and Industrial Poisons. N. von Jagić and H. Seyfried.—p. 400.
Symptomatology of Echinococcus Alveolaris of Liver. H. Wendt and F. Oehr.—p. 401.
*Present Status in Therapy of Acute Pancreatic Necrosis. R. Demel.—p. 404.
Significance of Adjustment of Ferments for Course of Infection and Defense Against It. E. Abder.—p. 408.
Constitution and Heredity in Endocrinopathia. H. Curschmann.—p. 409.
Question of Early Diagnosis and Treatment of Gastric Cancer. H. Prinz.—p. 412.

Treatment of Acute Pancreatic Necrosis.—According to Demel, diagnosis of acute pancreatic necrosis was formerly regarded as an indication for immediate operation. Evaluation of the results of early operation disclosed a mortality of from 52 to 78 per cent, and necropsies revealed that the necrotic process is not arrested by the operation. These observations induced many surgeons to adopt a conservative attitude. The tendency now, in the presence of acute pancreatic necrosis, is to put the digestive tract at rest. This effects a cure in the majority of the cases. Even in the grave cases the operation is postponed until the dangerous acute symptoms have subsided. Immediate laparotomy is done only if the diagnosis is not entirely clear and perforation of a gastric or duodenal ulcer or of the gallbladder or an ileus seem possible. If the laparotomy discloses an acute pancreatic necrosis the abdominal cavity is closed without further intervention. Surgical treatment becomes necessary when a pancreatic abscess develops at a later stage. Operation in the interval is likewise indicated if biliary symptoms have not entirely disappeared and if the history suggests disease of the biliary tract. Surgical treatment of biliary tract disease mitigates the danger of relapse of acute pancreatic necrosis. Medical and dietetic treatment are important during the early stage. Shock is treated by drip infusion of dextrose and insulin and by circulatory stimulants. Atropine may be helpful because it decreases pancreatic secretion and counteracts irritation of the vagus and vascular spasms.

Folia Pharmacologica Japonica, Kyoto

32:1-102 (May) 1941. Partial Index

- *Influence of Opium Alkaloids on the Acid-Base Balance and the Gaseous Exchange in the Blood of Rabbits. F. Ra.—p. 76.

Opiates and Blood Chemistry.—Ra investigated the changes, particularly the acid-base equilibrium and gaseous exchange, which opium alkaloids produce in the blood of both normal and sympathicotomized rabbits. Of the several varieties of opium alkaloids studied, namely morphine, heroin, codeine, apomorphine, papaverin and pantopon, the effect of morphine typifies the reactions induced by all the other opiates as well. When morphine hydrochloride was injected in doses varying from 20 to 100 mg. per kilogram of body weight, significant biphasic changes in the blood pH occurred. Being a respiratory depressant, morphine induces oligoxemia, which in turn leads to the accumulation of organic acids due to the incomplete oxidation of carbohydrates and proteins. The compensatory hyperbicarbonatemia accompanying such conditions was more than neutralized by a decided increase of free carbonic acid

(hypercapnia), causing a pronounced gaseous acidosis in the first stage of morphine narcosis. On the other hand, as the toxic effect of morphine wears off, the resulting polyoxemia accelerates the elimination of carbon dioxide and the slight excess in the alkali reserve causes a nongaseous type of alkalosis. Changes similar, though to a far less extent, are noted in animals with bilateral vagotomy, but in animals with bilateral section of the cervical sympathetic and splanchnic nerves the injection of morphine hydrochloride produced a nongaseous alkalosis without the preceding acidosis, owing to a pronounced hyperbicarbonatemia associated with only a slight hypercapnia. The author concludes that the autonomic nervous system plays an important role in the regulation of the acid-alkali balance of the body, since morphine acidosis was related to the sympathetic nerves and alkalosis to the parasympathetics. As judged from the biphasic reactions occurring in morphine narcosis, the tone tension of the autonomic system is the controlling factor in that the pronounced sympathicotomy explains the hyperglycemia and lactic acid acidosis as well as increase in blood epinephrine, while the moderate vagotomy accounts for a decrease in pulse and respiratory rates as symptoms of alkalosis.

Gann, Tokyo

35:65-132 (April) 1941. Partial Index

- *Inhibition of the Experimental Production of Liver Cancer by Millet Feeding. S. Morigami and N. Kasiwabara.—p. 65.
*Effect of Animal Tissue Feeding on Experimental Production of Liver Cancer, Especially the Inhibitory Effect of Kidney Tissue. K. Mori.—p. 104.
*The Sperm of Sea Urchin as a Biologic Test Object in Roentgen Dosimetry. M. Miwa, H. Yamashita and K. Mori.—p. 127.

Millet Feeding and Experimental Liver Cancer.—Morigami and Kasiwabara used 100 albino rats, 50 of which were fed millet and the remaining number polished rice as staple food, all receiving butter yellow over a period of one hundred and sixty-five days. Ten animals in the millet group survived the experimental period and in 5 of these the liver was found to be entirely normal, in 4 there was a mild proliferation of connective tissue and in 1 there was one nodular hepatoma, unaccompanied by the proliferation of either connective tissue or bile ducts. In all of the 5 animals of the polished rice group which survived the experimental period, typical hepatoma of varying degrees was observed. These results point to the presence in millet of a potent principle which has an inhibitory effect on the development of experimental butter yellow hepatoma.

Cystine and Experimental Butter Yellow Cancer.—Mori selected l-cystine as an example of the SH group of substances having close bearing on tissue growth, as advocated by Abderhalden and Wertheimer. The substance was incorporated into an olive oil solution of butter yellow in such a proportion that the animal consumed 1 Gm. of l-cystine for each kilogram of polished rice. After a one hundred and fifty day experimental period, involving two groups of 40 albino rats, one of which was used as a control, it was found that the feeding of sulphydryl compounds (l-cystine) had no effect on the experimental production of liver cancer by administration of dimethylaminoazobenzene (butter yellow).

Sea Urchin Sperm in Roentgen Dosimetry.—Miwa, Yamashita and Mori had previously shown that the time of the first cleavage of sea urchin eggs is delayed with increasing doses of radiation administered either to the eggs or to the sperm prior to insemination. In this study Miwa and his associates have determined the radiation quantity in the depth of a water phantom biologically and compared it with the results obtained by the ionic method. The principle utilized in this study is the fact that at room temperature the first cleavage of the eggs occurs within two hours after insemination and that at a given temperature the time of the first cleavage is determined only by the radiation quantity administered, depending neither on the duration of such irradiation nor on the time between irradiation and insemination. The sperm of sea urchin is reasonably radio-sensitive, 2,000 roentgens being sufficient to produce a delay in cleavage by approximately twenty minutes, the normal time at room temperature being about eighty minutes. The spawning season of each species of sea urchin differs from that of all the

others, so that the germ cells are available in almost any season. Based on experimental observations of two species of sea urchin, *Pseudocentrotus depressus* and *Strongylocentrotus pulcherrimus*, the authors conclude that the sperm of these species is entirely satisfactory as a test object in the determination of the roentgen ray dosage at constant distance and temperature.

Taiwan Igakkai Zassi, Taihoku, Formosa

40:647-856 (April) 1941. Partial Index

Wuchereria Bancrofti Infestation Among Inhabitants of Yaeyama Islands. T. Yosino and T. Nakasato.—p. 749.

*Anaphylactic Reactions with Fungi. K. Nakagawa.—p. 831.

Anaphylactic Reactions with Fungi.—Nakagawa examined allergic reactions with molds in guinea pigs, employing *Mucor Cunninghamii* and *Aspergillus oryzae* Cohn. The antigens were prepared both in the form of their saline extracts and in alcoholic precipitates of aqueous extracts of these fungi, and the results were judged by the degree of anaphylactic shock and by the nature of intestinal contractions. The preliminary sensitization procedure consisted of repeated intraperitoneal injections of diluted antigens; the anaphylactic phenomenon was observed after a lapse of two weeks following these injections, when the animals were given one intravenous injection of the same antigens. The shock phenomenon was recorded in terms of changes in body temperature as well as by observations of the clinical manifestations. The contractions of the excised intestine suspended in Tyrode solution were recorded by means of a kymograph. While the simple extracts of these molds gave rise to anaphylactic reactions in but a small number of animals, the alcoholic extracts were found to be effective in producing well defined reactions in nearly all animals. The two varieties of fungi investigated could not be differentiated by cross tests. From these observations the author concludes that it is experimentally possible to induce allergic reactions with *Mucor Cunninghamii* and *Aspergillus oryzae* Cohn in guinea pigs.

Vestnik Khirurgii, Leningrad

60:451-648 (Dec.) 1940. Partial Index

Nikolai Ivanovich Pirogov.—p. 451.

*Residual Blood Nitrogen in Appendicitis and in Adnexitis. L. K. Foy.—p. 455.

Functional Anatomy of the Lymphatic System. D. A. Zhdanov.—p. 459.

Peritonsillar Infection in a Surgical Clinic. Y. A. Elkin.—p. 468.

Peripheral and Visceral Neurinomas. M. M. Bass.—p. 476.

Statistics on Results of Surgical and Combined Treatment of Malignant Growths. A. Z. Kozdoba and E. Y. Shwarts.—p. 485.

*Pulmonary Suppuration. N. A. Vashchinskyy.—p. 499.

Residual Blood Nitrogen in Acute Appendicitis and in Acute Adnexitis.—Foy studied the residual blood nitrogen in 75 cases of acute appendicitis. In acute and subacute catarrhal appendicitis the residual nitrogen rose to 42 to 75 mg. per hundred cubic centimeters of blood, in suppurative appendicitis to 54 to 80 mg., in gangrenous forms to 50 to 85 mg. and in appendicular tumefaction or encapsulated abscess to 40 to 56 mg. This biochemical reaction manifested itself sooner than the leukocyte response. A study of 50 patients with acute and chronic inflammatory disease of the uterus, the adnexa and the parametrium showed that the residual blood nitrogen varied between 24 and 48 mg. per hundred cubic centimeters; that is, within normal limits. Determination of the residual blood nitrogen gives an earlier estimation of the course and gravity of the inflammatory process than the leukocyte count and may be utilized as a differential diagnostic sign between acute appendicitis and acute adnexitis.

Pulmonary Suppuration.—Of the 125 patients with pulmonary suppuration who were the subject of the report by Vashchinskyy, 86 per cent were males and 81 per cent had a past history of pneumonia, pleuritis, grip or bronchitis. There were twice as many heavy smokers as nonsmokers. No definite etiologic role could be assigned to any factor. Dry diet regimen, postural drainage, neoarsphenamine and emetine proved ineffective. Best results were accomplished with roentgen irradiation. Of 80 patients treated with roentgen radiation a cure was

obtained in 68 per cent. Irradiation combined with conservative operative interventions of the collapsing type had a mortality of 9 per cent as compared with 30 to 40 per cent obtained with the operation of pneumotomy at the hands of master thoracic surgeons. The author therefore feels that indications for pneumotomy should be further delimited.

Maandschrift voor Kindergeneeskunde, Leyden

9:427-460 (Aug.) 1940

Myositis Ossificans Progressiva. S. van Creveld and J. M. Soeters.—p. 427.

*Abdominal Tuberculosis in Children. R. J. Harrenstein.—p. 442.

Conception Presenting Appearance of Spina Ventosa. N. I. Heybroek.—p. 453.

Recognition of Intestinal Invagination. A. G. Schoo.—p. 457.

Abdominal Tuberculosis in Children.—Harrenstein includes under the term abdominal tuberculosis peritoneal involvement, tuberculosis of the mesenteric lymph nodes and of the abdominal organs, particularly the intestine. The slight cutaneous sensitivity of these patients to tuberculin increases the diagnostic difficulties. In 47 the diagnosis was established by operation. The first diagnosis in the majority of the 48 children had been erroneous, the tuberculous process being frequently mistaken for appendicitis. Tuberculosis of the mesenteric lymph nodes was established in 20 of the 48 and tuberculous peritonitis in 23; in 5 intestinal tuberculosis was suspected. Six patients died, while 42 were discharged as cured and remained in good health.

9:461-500 (Sept.) 1940. Partial Index

Melanoblastosis Cutis Linearis. S. Systematisata. W. L. L. Carol and D. J. H. Bour.—p. 461.

*Treatment of Chorea Minor with Intralumbar Injections of Autoserum. H. Broekema.—p. 477.

Umbilical Sepsis. A. van Westrienen.—p. 492.

Intraspinal Autoserum in Chorea Minor.—Broekema resorted to intraspinal injection of autoserum in the treatment of chorea minor in 13 children. Injection of 10 cc. of the patient's own serum is frequently followed by headache, fever and vomiting. In some patients one injection effects a cure but in most cases from two to four injections were necessary. The results were as favorable as those obtained with other treatments, but, unlike other measures, autoserotherapy is without danger and may be successful when other methods have failed.

Nordisk Medicin, Stockholm

10:1431-1510 (May 10) 1941. Partial Index

Hygiea

Regeneration of Skin Epithelium. G. Levander.—p. 1489.

Endometriosis as Cause of Ileus. O. Hultén.—p. 1492.

*Cholesteatoma in Ear. M. Uddströmer.—p. 1496.

Frequency of Hypertonia in Diabetes Mellitus Treated with Diet and with Normal Diet. S. Törnell.—p. 1501.

Cholesteatoma in Ear.—Uddströmer asserts that cholesteatoma occurs in about one third of all chronic inflammations of the ear, is more often in men and is present in most epitympanic cases. It varies from the size of a hemp seed to that of a hazel nut, but giant cholesteatomas and microcholesteatomas have been described. A characteristic of the cholesteatoma is putrid degeneration in its interior, giving rise to a thick, purulent, fetid discharge of a dirty gray color. Spontaneous healing is rare. In about two thirds of the cases conservative treatment gives good results. The importance of lavage with fluids nearly or wholly free from water (as alcohol, carbon tetrachloride) is stressed. Surgical treatment is indicated in threatened or developed intracranial complications, in paralysis of the facialis, subperiosteal breaking through to the mastoid process, in cases in which from four to six weeks' conservative treatment has proved ineffective, in cases of troublesome recurrence between periods of successful conservative treatment, and in cases in which the conditions for conservative treatment are unfavorable. With proper treatment before the onset of complications the prognosis as to life is favorable. In untreated or improperly treated cases there is danger of complications, mainly intracranial, threatening life.

Book Notices

Annual Reprint of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association for 1940 with the Comments That Have Appeared in The Journal. Cloth. Price, \$1. Pp. 181. Chicago, 1941.

The thirty-nine reports contained in this volume range in subject from records of drugs cast on the therapeutic scrap heap to statements on the names and uses of latest additions to the physician's armamentarium. Among the discontinued are two proprietary drugs, Isacen and Melubrin: Isacen was accepted in 1926 as a nontoxic laxative or purgative; Melubrin is an antipyretic which seemed to have promise when it was accepted in 1913 but which the manufacturer has now ceased marketing. At the time these preparations were accepted the Council expressed some misgivings which later proved justified.

Among the reports on nomenclature are those designating "pyridoxine" and "pyridoxine hydrochloride" for vitamin B₆ and vitamin B₆ hydrochloride, "sulfathiazole" for 2-sulfanilamidothiazole and "sulfamethylthiazole" for 2-sulfanilamido-4-methylthiazole. Preliminary reports on these drugs as well as on phenothiazine and histaminase are included.

Other noteworthy preliminary reports are on guanidine hydrochloride-Calco, which has been proposed for use in the treatment of myasthenia gravis, and acetylglycarnobenzene, a new antisyphilitic for intramuscular use, which the Council feels should be further perfected. In its report the Council comments with approval on the manner in which the Winthrop Chemical Company has developed the latter and studied it before even considering its commercial production.

All the so-called reports of status are noteworthy. The report on the present status of the injection treatment of hernia is a continuation of the Council's consideration of this question; it condemns the exploitation of the injection treatment of hernia by manufacturers of solutions. Another report concerns lipocaic, a new pancreatic hormone concerned with the normal transport and utilization of fat. The Council awaits development of further clinical evidence for lipocaic and expresses the opinion that the method should not be recognized for routine practice.

There are a number of interesting reports in the "nonacceptable" category; the one on the widely exploited neurosine of the Dios Company sounds a timely warning on the hazards of bromidism and uncontrolled hypnotic medication. The report rejecting a number of preparations of gonadotropic hormone from the serum of pregnant mares, together with the report rejecting certain ovarian and ovarian anterior pituitary preparations, attests the Council's continued critical interest in the field of endocrinology. This is also indicated in the report on desoxycorticosterone written by Dr. Edgar S. Gordon and adopted by the Council for publication with a statement of the Council's attitude on the present status of adrenal cortex. The Council finds adrenal cortex therapy now in an unsatisfactory and unsettled state.

Mention must be made of the excellent report on organic mercurial compounds as bactericidal agents, which states the Council's conclusion that none of the organic mercurial compounds offered will guarantee the destruction of spores under all conditions.

Another valuable report is that on the promiscuous use of the barbiturates. This is a continuation of a previous study of the use of barbiturates in suicide. The present study is an analysis of hospital data.

Your Teeth: Their Past, Present, and Probable Future. By Peter J. Brekhuis, B.A., D.D.S., Professor of Oral Diagnosis, School of Dentistry, University of Minnesota, Minneapolis. With a foreword by Irvine McQuarrie, Ph.D., M.D., Professor and Head of the Department of Pediatrics, University of Minnesota. Cloth. Price, \$2.50. Pp. 255, with 20 illustrations. Minneapolis: University of Minnesota Press, 1941.

This book is a scholarly and important contribution to health literature for intelligent lay readers. It is also a valuable and readable review for general practitioners of medicine and for dentists. The bibliographies alone constitute a veritable "Who's Who" in modern dental research. The book is beautifully printed and illustrated with many plates and diagrams. It is well indexed.

The book is a severe indictment of civilization, at least as far as the teeth are concerned. Whatever the specific causative factor may be, civilization is ruinous to the teeth. Primitive man wore his teeth to stumps and suffered from abscesses and pyorrhea but did not know dental caries as we know it. Modern savages appear to suffer caries in direct proportion as they come in contact with civilization. The Eskimo, the Maori, the Bantu, the Zulu, the Bedouin, the Igorot, the Samoan, the Thibetan or the Chinese each has better teeth than the American or European. In China it has even been shown that the teeth improve among the natives as one departs farther from the vicinity of the foreign commerce ports.

The author discusses extensively the theories as to why dental caries is increasingly prevalent in generation after generation of civilized persons, to the extent that each generation has, as a whole, poorer teeth than the preceding. The three theories which have been suggested most seriously to explain dental caries are the infection theory, the nutrition theory and the functional theory. Each has evidence in its support and numerous protagonists, but none explain all the facts. The author seems to lean more to the functional theory, though he is cautious about endorsing any without reservation. He points out, however, that the progressive diminution in the size of the jawbone, even in a few recent generations, indicates strongly that the use of the teeth is more important than either nutrition or infection or, for that matter, heredity, to which he appears to give little weight. He does not regard gum chewing as use of the teeth.

Aside from the large amount of space devoted to the problem of caries there are excellent discussions of the relation of dental health to general health, pyorrhea, malocclusion, why we lose our teeth, progress from witch doctor to modern dentist, the teeth of other races, dental disease and dental adaptation among animals, the development of human teeth, biologic factors in the loss of teeth, and how we can save our teeth.

The book is scientific in approach, cautious in evaluation and conservative in opinion. It offers a well balanced discussion, with admittedly a pessimistic conclusion as to the likelihood of saving our teeth. Medical readers will probably object to the author's recommendation that, in effect, the government ought to embark on a huge dental care program for all the people, without, however, interfering with private dentistry for those who can pay for it! This excursion into the economic field is the only feature of the book which suggests adverse criticism.

Brucellosis (Undulant Fever): Clinical and Subclinical. By Harold J. Harris, M.D., Health Officer, Westport, N. Y. Foreword by Walter M. Simpson, M.D., F.A.C.P., Director, Kettering Institute for Medical Research, Miami Valley Hospital, Dayton, O. Cloth. Price, \$5.50. Pp. 286, with 56 illustrations. New York & London: Paul B. Hoeber, Inc., 1941.

Despite the rapid succession of reports, particularly during the past decade, of the widespread incidence of brucellosis in this country as well as in most other parts of the world, a feeling of skepticism apparently still exists in the minds of many physicians regarding any wide prevalence of the disease. The contributions of many reliable American investigators in the fields of medical and veterinary science have done much to dissipate this aura of doubt. The monograph by Harris is particularly timely, since it provides undeniable evidence that brucellosis is a much more important public health problem than the official records of state health departments would indicate.

While Harris has devoted a considerable portion of his book to a recitation of his personal experiences with some 250 patients, it contains also a liberal and well balanced consideration of the world literature bearing on this subject. The material in the book is well organized and has a facile style which makes for early reading. The author marshals strong evidence to dispose of the persistent fallacies that the disease is uncommon, that it is self limited, that it is easily recognized through the finding of a high serum agglutination titer in a patient acutely ill, that a negative agglutination test rules out brucellosis, that a positive cutaneous test alone establishes the diagnosis and that brucellosis is easily cured by a variety of therapeutic agents or by time alone.

Ordinarily such a monograph represents the results of studies made in the favorable environment of a university or in a large

research institution. Harris, on the contrary, faced and overcame obstacles which would ordinarily be regarded as insurmountable. A part time health officer and an active practitioner in a rural area, he was faced with the necessity of dispatching specimens of blood, urine, exudates and tissues to the nearest properly equipped laboratory, 135 miles away, for confirmation of his own clinical and laboratory observations. The necessary literary research was done without immediate access to a suitable medical library. The book has the refreshing approach of one who, as the result of day by day general practice, had borne in on him gradually the realization that he was surrounded by a common disease which he had overlooked for over a decade. The advantages of close and long continued personal contact with loyal patients in a rural area played an important role in the evaluation of diagnostic and therapeutic measures. Harris's successful pursuit of his subject provides another example of the fact that many important contributions to medical literature have come from the pens and the minds of physicians who labored in obscure places without the advantages that are too often regarded as indispensable.

Some students of brucellosis will disagree with Harris in the emphasis he places on the opsonocytophagic test as a diagnostic procedure and as a guide to therapeutic response. There is a growing belief that this test possesses little merit and that it often leads to confusion. It should be recognized, however, that the value of the diagnostic tests (agglutination test, intradermal test and opsonocytophagic test), in the absence of cultivation and identification of the organism, is a subject for lively disagreement among investigators, particularly in the diagnosis of the widespread chronic ambulatory form of brucellosis.

This monograph is addressed chiefly to the general practitioner, to whom the opportunity is usually first presented for the recognition of the disease. The internist, the neurologist, the ophthalmologist, the dermatologist, the orthopedist, the radiologist and the clinical pathologist will likewise profit from a perusal of this clear, concise and authoritative monograph. The publishers are also to be felicitated for the artistic format and for the faithful reproduction of the many illustrations, including several kodachrome pictures of the cutaneous lesions.

Malignant Disease and Its Treatment by Radium. By Stanford Cade, F.R.C.S., Surgeon, Westminster Hospital, Mount Vernon Hospital, and The Radium Institute, London. Fabrikoid. Price, \$18. Pp. 1,280, with 623 illustrations. Baltimore: William Wood & Company, 1940.

This large volume represents the personal experience and point of view of the author, long an English leader in radium therapy. The technic and end results are based on an experience in the radiation treatment of more than three thousand cancers during the period of 1924 to 1939.

There are three major subdivisions of the book. The first section, dealing with the physics of radiation, includes chapters on radioactivity, radium dosimetry, general principles of technic in radium therapy and telerradium treatment. The second section is devoted to the biologic effects of radiation, such as radiosensitivity, the mode of action of radiation, the effects of radium on normal tissues, the effects of radium on malignant tumors and radium dangers and protection. The final section surveys the natural history and treatment of malignant tumors, with the chapters divided according to the region or tissues involved, such as the lip, tongue or breast. After a preliminary and well summarized review of the incidence, etiology, pathology and symptomatology of the regional tumor under consideration, the surgical indications and limitations are carefully stated. The remainder and major portion of each chapter is then concerned with the details of radium therapy and the end results of this treatment. In this respect the book is a welcome variation from many previously published textbooks on radiation therapy, for the author, a surgeon, has a complete freedom from bias for any particular form of treatment. As he states, "the ideal choice can only be made if all forms of treatment are available and if the choice is independent of any vested interest in an x-ray machine, a quantity of radium, or the possession of the requisite skill and courage to undertake major surgical operations." Seven of the thirty chapters have been written by colleagues of Mr. Cade, and they have been well selected as authorities in their respective fields.

In summary the book is an up to date, thorough treatise on radium therapy. In American radiology there have been many substitutions of improved roentgen ray application for some of the radium technics herein described and there are other differences of opinion, e. g. concerning the curability of malignant melanoma by irradiation, although this should not handicap the general usefulness of the book. It is regrettable that the euphemism of "malignant disease" should appear in the title of this book rather than the more specific and entirely adequate term "malignant tumors," which the author really means, in contradistinction to other "malignant" diseases such as bubonic plague, typhus fever and heart disease.

Papers of Wade Hampton Frost, M.D.: A Contribution to Epidemiological Method. Edited by Kenneth F. Maxey, M.D. Cloth. Price, \$3. Pp. 628, with illustrations. New York: Commonwealth Fund; London: Oxford University Press, 1941.

This collection of the papers of the late Dr. Wade Hampton Frost is a book which should and probably will find a permanent place in the library of every physician interested in public health. It offers a splendid example of the development of epidemiologic method and furnishes, in addition, perpetuation and convenient accessibility for some of the more significant investigations of this distinguished epidemiologist.

The collection is organized in five sections, preceded by an editor's preface and a biographic sketch of the author. Section one contains three papers, representing respectively studies of outbreaks of typhoid, septic sore throat and anterior poliomyelitis. Section two is devoted to stream pollution and water purification studies, including a review of the work of the United States Public Health Service in this field. In section three are included studies of endemic acute infectious diseases: influenza, common colds, acute minor respiratory infections in a group of Baltimore families, minor respiratory diseases observed during an influenza epidemic and a noninfluenzal period, and two studies on diphtheria. Section four includes an essay on the specialty of epidemiology, one on the familial aggregation of infectious disease, the rendering of accounts in public health, and one on authoritative standards in epidemiology. Section five takes up the study of infectious disease of long duration, including papers on familial contacts in pulmonary tuberculosis, age selection of mortality from tuberculosis in successive decades, and a philosophical paper entitled "How Much Control of Tuberculosis?"

The editor has chosen well in selecting these papers. The collection represents a diversity of problems and approaches, as well as an example of progress in epidemiologic method over a period of time. The papers themselves are worthy of intensive study, not only for methodology and the historical significance of facts presented, but for the painstaking quality of each investigation, logical organization and clear presentation, and keen but cautious reasoning in arriving at conclusions. The book is beautifully printed and made and is profusely illustrated with maps, graphs and tables. The original manuscripts have been modified only to the extent of correcting obvious printer's errors, and such corrections are properly identified. The tables and maps have been remade in the interest of uniformity. There is a complete bibliography of the author's papers, and a good index.

This book seems destined to become one of the classics in medical literature.

Spectrochemical Abstracts. Vol. 11: 1938-1939. By Ernest H. S. van Someren, B.Sc. Cloth. Pp. 38. London: Adam Hilger, Limited, 1941.

Spectrochemical Abstracts should be present in every laboratory employing or interested in the application of spectrographic methods. One hundred and sixty-five literature abstracts are presented. The most valuable section gives reviews of ten books and reviews of abstracts, general papers, charts and labels which appeared during 1938 to 1939. The bibliographic material is arranged in two parts, part I giving authors and references and part II brief descriptions of contents and explaining methods and results obtained. The booklet is a continuation of the "Spectrochemical Abstracts 1936-1937" edited by Twyman. It is noteworthy that spectrographic methods are more and more applied in problems related to biology and medicine. The job of the "urine tester" has been passed to the

highly trained and skilled technician who identifies porphyrins and other substances in the urine with equal precision as when asked to examine a few strands of hair for arsenic. Murder cases are solved by identifying the copper content of the powder charge in the wounds. The quantitative nature of benzene poisoning and the identification of carcinogenic substances are equally well substantiated by spectrographic methods. In many instances these methods have replaced tedious, conservative chemical procedures. A physician involved in medicolegal consultation or one who finds time and energy to keep abreast with newer research developments will find reliable information on methods and equipment, including a correlation and integration of the application of spectrochemistry for his particular interest.

Arthritis and Allied Conditions. By Bernard I. Comroe, A.B., M.D., F.A.C.P., Instructor in Medicine, University of Pennsylvania, Philadelphia. Second edition. Cloth. Price, \$9. Pp. 878, with 242 illustrations. Philadelphia: Lea & Febiger, 1941.

This edition contains new chapters, the most important being a discussion of the sulfonamides, including the best known compounds. More than forty original photographs have been added. Among the features of the book are the large number of summaries presented in box form which enable the general practitioner to visualize quickly the important information. The author has made a fine survey of the literature. He has given the general practitioner an outline of the subject of gold salts in the treatment of rheumatoid arthritis, physical therapy, vaccines, endocrine preparations and the large number of medical agents used in the treatment of this disease. He has added a summary of the value of vitamin E in fibrositis and the medical and roentgen ray management of spondylitis. He has made an attempt to evaluate the various controversial questions such as focal infection, vitamins, diet, backache, flat feet, arch supports and the sulfonamides. An "arthritic record" including history, consultations, laboratory results, diagnosis and therapy together with diagrams and the use of the Jansen ciphers is instructive. In the chapter on splinting of affected joints, the author says that there must be sufficient motion to prevent ankylosis and sufficient rest to permit healing. If this principle was adhered to, physicians and patients would be gratified by the good results obtained. In the discussion on massage in rheumatoid arthritis, the author states that "proper massage requires the assistance of one trained in this field." He correctly states that vaccines must be used only as a part of the general antiarthritic regimen. There are no short cuts to success in dealing with arthritis. One chapter concerns the role of allergy in arthritis. There are good chapters on roentgen diagnosis and roentgen therapy, another on rheumatic fever, and a fine description of gout and sciatica. The chapter on painful shoulders is excellent.

Outlines of Industrial Medical Practice. By Howard E. Collier, M.D., Ch.B. Cloth. Price, \$5. Pp. 440. Baltimore: William Wood & Company, 1941.

The author divides "industrial medicine" into four main sections: industrial hygiene, industrial psychology, industrial disease and industrial forensic medicine. In the earlier chapters of the book the more strictly executive functions of the works doctor are described, while the latter portion deals with his advisory functions. It is most important that the distinction between executive duties and advisory functions of industrial physicians be clearly distinguished. The author's recognition of the importance of industrial psychology is demonstrated by the seven chapters devoted to this subject. Part four of the book deals with industrial medicine and gives satisfactory discussions of the various common diseases ascribed to occupation. Only one short chapter in the early part of the book deals with the care of the injured workman. The fact that the author has in this way deemphasized injuries and traumatic surgery illustrates his broad approach to the problems of industrial medical practice. The fifth part of the book is devoted to industrial forensic medicine and gives a review of the factories act of 1937, the public health act in 1936, and various compensation and allied acts bearing on the problems of labor. An extensive bibliography is appended. While this work is written from the point of view of the British industrial physician, it serves as a most satisfactory outline for those in America who are interested in the subject.

Études sur les amputations et désarticulations des membres. Par P. Huard, professeur d'anatomie et de médecine opératoire à l'École supérieure de médecine de l'Indochine. Paper. Pp. 686, with 285 illustrations. Paris: Masson & Cie; Hanoi: G. Taupin & Cie, 1940.

This volume includes a study of amputations and disarticulations of the extremities. The author is one of the leading authorities of France, who has been a student under the greatest French surgeons. He was professor of anatomy and operative surgery at the School of Medicine in Indo-China. He was one of the leading surgeons of the colonial service of France. He was a student of the famous Broca. The book comes from Hanoi, French Indo-China, and represents the latest point of view of the French school of operative surgery. In the first part the author provides the physiopathologic considerations of normal amputation. The second chapter includes general indications for the larger amputations and disarticulations of the extremities. The third chapter contains the technic of the larger amputations and disarticulations of the members. Another chapter discusses the generalizations or rules concerning prostheses following amputations. In the second part of the book are amputations and disarticulations of the upper extremities, extending from the fingers to the interscapulothoracic disarticulation, giving the indications, technic of operation, the follow-up care and the end results. The third part contains a discussion of amputations and disarticulations of the lower extremities. The rare type of interilioabdominal disarticulation is described and illustrated. The author states that the war interrupted his writing of the book and that he had to complete it more rapidly than he had anticipated. A voluminous bibliography is included. The rare type of interilioabdominal disarticulation is described fully and illustrated profusely.

Approved Laboratory Technic: Clinical, Pathological, Bacteriological, Mycological, Parasitological, Serological, Biochemical and Histological. By John A. Kolmer, M.S., M.D., Dr.P.H., Professor of Medicine, Temple University, Philadelphia, and Fred Boerner, V.M.D., Assistant Professor of Bacteriology, School of Medicine and Graduate School of Medicine, University of Pennsylvania, Philadelphia. Third edition. Cloth. Price, \$8. Pp. 921, with 380 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1941.

This book is devoted to describing the technic of methods for the performance of various and numerous laboratory examinations. While the authors selected the particular methods described, the description of the technic of each method has been definitely approved also by at least five members of the American Society of Clinical Pathologists. The descriptions are full and detailed, in some cases even the simplest of details being given in order to insure greater accuracy and uniformity in results. This field of medicine is advancing so rapidly that a new edition has been considered necessary three years after the previous edition was published. Among the new methods included in this edition are those for the determination for vitamin C in urine and plasma, those for the determination of sulfonamide compounds in the blood and urine, for the determination of thiocyanates in the blood, the Eagle modification of the Wassermann test, the technic of the simplified Kolmer complement fixation test for syphilis, Sparkman's method for the determination of urobilinogen in the urine and feces as a test for liver function, Quick's method for the estimation of hippuric acid in the urine as a liver function test, methods for the examination of semen, and Quick's method for the quantitative determination of prothrombin. A book on this order would seem to be almost indispensable to students, practitioners and others who are engaged in the laboratory diagnostic field.

Modern Drugs in General Practice. By Ethel Browning, M.D., Ch.B. Cloth. Price \$3. Pp. 236. Baltimore: William Wood & Company, 1940.

The author believes that there is need for a book which presents necessary information in compact form about the value, availability, correct application and potential danger of new drugs. She lists such drugs under the headings of sulfanilamides, gold salts, cardiac drugs, drugs acting on the autonomic system, sedatives and hypnotics, diuretics and antiseptics, gastrointestinal remedies including anthelmintics, external applications including antiseptics, disinfectants and local antiseptics. She regrets that there is not in Great Britain any official body con-

responding to the Council on Pharmacy and Chemistry of the American Medical Association, and her work to some extent fulfils this lack. The application to clinical medicine of the sulfonamide group represents the greatest advance in the treatment of bacterial infection since Ehrlich's discovery of arsphenamine in 1904. She gives details for the administration of these, including diets low in sulfur. This is because these drugs may cause sulfhemoglobinemia. Gold therapy, she says, has been more popular on the continent than in England, and more popular in England than in America. While not enthusiastic about its use, she gives the latest methods of how it is best used. The important cardiac drugs are briefly treated, with the clinical essentials. A summary of the clinical use of drugs acting on the autonomic nervous system, and also sedatives and hypnotics, is given. The chief advance in the therapy of gastrointestinal disturbances, the author says, lies perhaps in the substitution of new "antacids" for the old alkalis. She includes in this especially the use of aluminum hydroxide and magnesium trisilicate. Anthelmintics are treated succinctly yet adequately. The use of antiseptics is given briefly. This small book shows a practical knowledge of the drugs discussed and gives in compact form and clear language the methods of using them. References to the important literature on which the recommendations are based are given.

Prostatectomia por via perineal. Por Armando Mendez. Tests para optar al título de doctor en medicina, Universidad nacional de Buenos Aires, Facultad de ciencias médicas. Paper. Pp. 129, with 76 illustrations. Buenos Aires: Imprenta Mercatalli, 1940.

This review of perineal prostatectomy gives an exhaustive description of the anatomy of the perineum, paying particular attention to the muscular and fascial planes in relation to the blood supply of the prostate. In addition to the ordinary descriptive text, important anatomic points are brought out by an excellent series of diagrams which illuminate the important surgical relations. The exact details of perineal prostatectomy are limited to the surgically open dissecting anatomic methods first developed by Proust in France and by Young in the United States. This technic is minutely described and illustrated. The author gives an excellent description of the Wildbolz method of repair of the posterior urethra after removal of the prostate. He also describes the avascular prostatic approach of Gill Vernet, but he does not mention the early American methods of perineal prostatectomy using a midline incision and a blind enucleation of the tumor with the educated finger. As advantages of perineal prostatectomy are presented, first, that it is easier to remove the prostate completely by this route; second, that the convalescence is shorter; third, that there is better drainage; fourth, that the mortality is lessened and, fifth, that less hemorrhage results because of the open surgery. As disadvantages there are mentioned, first, that perineal prostatectomy demands a very exacting technic, and, second, that rectal fistula, urinary fistula, incontinence of urine and impotence occur much more frequently than after suprapubic operation.

Medicine. By Dwight O'Hara, M.D., F.A.C.P., Professor of Preventive Medicine, Tufts College Medical School, Boston. Vocational and Professional Monographs No. 4. Paper. Price, 50 cents. Pp. 28. Boston: Bellman Publishing Company, Inc., [n. d.].

This monograph is designed to supply fundamental information to those who are considering entering a medical school or engaging in the practice of medicine. The author is qualified to express opinions in view of having taught at Harvard, Boston University and Tufts College Medical School and of being president of the Middlesex South District Medical Society in Massachusetts and a member of the House of Delegates of the American Medical Association. The monograph contains twenty-four small sections, some of which are named "The Choice of a College" and "The Choice of a Medical School." He lists the recognized medical schools and gives brief data concerning each one. Other sections pertain to the personal qualifications required for engaging in medical work, the chances for advancement, the advantages and disadvantages of the work, general practice and specialization. This discussion will broaden the point of view of premedical students, especially, and help them to make their decision.

Scabies—Civil and Military: Its Prevalence, Prevention and Treatment. By Reuben Friedman, M.D., Assistant Professor of Dermatology and Syphilology, Temple University School of Medicine, Philadelphia. Cloth. Price, \$3. Pp. 288. New York: Froben Press, 1941.

This book by Friedman, who wrote also "The Emperor's Itch," is an especially timely contribution, since "the incidence of scabies inevitably rises during and immediately after war." Military experience indicates that approximately ten days are required for the care of a case of scabies, so that the problem might well assume serious proportions now that we are approaching full mobilization. Every phase of scabies is considered in this book—its history, clinical picture, incidence, treatment and public health aspects. Of unusual and particular interest are the chapters dealing with the historical phases of the disease. One of the most significant documents in the history of disease, Bonomo's letter to Redi, is reproduced, and historical references are directed not alone to the nature of the disease but also to its treatment. The chapter on treatment is brought down to date. Every method that has been recommended is critically considered and described in detail with the conclusion that no one remedy can be invariably successful and, not infrequently, one has finally to resort to good old fashioned sulfur ointment. Altogether the monograph is an excellent source book full of interesting and useful information. Had the book contained some photographic illustrations and an academic chapter devoted to the diagnosis and differential diagnosis of scabies its value might have been enhanced. The book is well indexed, is profuse in footnotes and contains an extensive bibliography.

Notes on Diffuse Sclerosis, Diffuse Gliomatosis and Diffuse Glioblastomatos of the Brain with a Report of Two Cases. By Lårus Einarson, Professor of Anatomy, University of Aarhus, Aarhus, and Axel V. Neel, Pathologist to the Psychiatric Laboratory, University of Copenhagen, Copenhagen. Acta Jutlandica Aarsskrift for Aarhus Universitet XII. Paper. Price, 2.50 Danish kroner. Pp. 56, with 25 illustrations. Aarhus: Universitetsforlaget; Copenhagen: Ejnar Munksgaard, 1940.

This is a short monograph on the relationship of diffuse sclerosis, diffuse gliomatosis and diffuse glioblastomatos. The authors report two cases pertinent to the problem of the existence of a glioblastomatous transition form of a diffuse sclerosis. It is their opinion that such is a possibility; that is, that diffuse glioblastomatos may result from diffuse sclerosis and gliomatosis. There is a good classification of the demyelinating diseases. There is a fairly good bibliography. This monograph is recommended to neuropathologists.

Food Analysis: Typical Methods and the Interpretation of Results. By A. G. Woodman. International Chemical Series. Louis F. Hammett, Ph.D., Consulting Editor. Fourth edition. Cloth. Price, \$4. Pp. 607, with 132 illustrations. New York & London: McGraw-Hill Book Company, Inc., 1941.

This widely used textbook contains much additional material in the new edition, but it remains a book of essentials for students and beginners rather than a handbook for experts. There is no discussion of methods of analysis for calcium, iron or iodine. There is no description of methods for the determination of lead in foods. Vitamins, several of which now can be determined with reasonable accuracy by biochemical and physical methods, are not even mentioned. The material contained in the book is basic, however, and it is presented systematically and clearly.

Meat for Millions. Report of the New York State Trichinosis Commission. State of New York Legislative Document (1941) No. 52. Paper. Pp. 282, with 16 illustrations. Albany: Fort Orange Press, Inc., Printers, 1941.

This book provides a history of activities of the New York Trichinosis Commission. As a result of its deliberations a number of recommendations were made regarding the feeding of hogs, the handling of pork products, meat inspection and miscellaneous items, all designed to protect the public from infested meat.

Archiv und Atlas der normalen und pathologischen Anatomie in typischen Röntgenbildern. Die Differentialdiagnose der Wirbelsäulentuberkulose. Von Priv.-Doz. Dr. J. E. W. Brocher. Fortschritte auf dem Gebiete der Röntgenstrahlen, Ergänzungsband LX. Herausgeber: Prof. Dr. Grashey. Cloth. Price, 16.20 marks. Pp. 88, with 129 illustrations. Leipzig: Georg Thieme, 1941.

This is a beautiful atlas of 129 illustrations, chiefly roentgenograms that are highly instructive and beautifully reproduced, evidently taken from one of the leading journals of roentgenology of Germany.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

REVACCINATION AGAINST TYPHOID

To the Editor:—I have encountered a variety of conflicting recommendations with regard to revaccination against typhoid and paratyphoid at the expiration of the two to three year period of relative immunity produced by the first vaccination. Some advise the administration of the original 2,500 million organisms in divided doses; some advise the administration of only a fraction of this amount; Siler (*Am. J. Pub. Health* 29:95 [Feb.] 1939) recommended a single intracutaneous injection of 0.1 cc. of vaccine. The latter certainly has the merit of convenience, but public health officials and bacteriologists whom I have consulted seem uncertain as to its reliability. Can you tell me what is the approved method of repeated revaccination and how frequently it should be performed?

M.D., Massachusetts.

ANSWER.—Experimental evidence (titration of the serums of revaccinated individuals by means of the mouse protection test) indicates that the administration of a single dose of 0.1 cc. of typhoid vaccine (100 million organisms) intracutaneously is a reliable method of renewing protection. The titrations obtained by this method average approximately as high as those obtained following revaccination by the usual three dose course of typhoid vaccine given subcutaneously. The small single dose method is now being used for revaccination by several health agencies. Revaccination should be repeated at not less than two year intervals, while a one year interval is preferred.

CARBON TETRACHLORIDE POISONING AND MUSCULAR ATROPHY

To the Editor:—Three employees of a dry cleaning establishment showed unmistakable evidence of carbon tetrachloride poisoning from a carbon tetrachloride machine before an adequate ventilating system was installed. Two of the employees have recovered completely. The other employee has developed a classic case of spinal muscular atrophy. A careful neurologic examination showed no sensory disturbance whatever. Two examinations of the spinal fluid showed it to be normal in every respect. The diagnosis was first made in my office and was later confirmed by a competent neurologist in another city. From all the evidence that I have been able to gather, this man was perfectly well before his exposure to carbon tetrachloride. In the literature that is available to me I have been unable to find reports of patients exhibiting similar neurologic lesions following exposure to carbon tetrachloride. Evidence suggesting that such cases are a possibility is provided in the report of Smyth, Smyth, and Carpenter in the *Journal of Industrial Hygiene and Toxicology* for May, 1936, in which they state that degenerative changes were found in the sciatic nerves of experimental animals exposed to carbon tetrachloride. Any information that you can give me concerning the possibility of this man's condition being the result of his exposure to carbon tetrachloride will be appreciated.

W. M. Kinney, M.D., Joplin, Mo.

ANSWER.—In speaking of progressive spinal muscular atrophy Osler, in *Modern Medicine* (Philadelphia, Lea & Febiger, 1910, vol. 7, p. 84) says "It is exceedingly questionable whether infections or intoxications cause the symptoms although the development of progressive muscular atrophy many years after an arrested acute poliomyelitis is regarded by Léri as evidence of this origin. Some toxic substances acting on the cells weakened by acute poliomyelitis may cause progressive muscular atrophy." The only probable agent mentioned is lead.

In view of the fact that changes in the optic nerve and the sciatic nerve have been observed in some rats and monkeys after prolonged exposure to high concentrations of carbon tetrachloride, which changes persisted after recovery from other effects, one cannot exclude the possibility of chronic nerve damage, though no records of such cases in man have been found.

André Domart, in the most recent comprehensive paper on carbon tetrachloride (*Nephritis par inhalation de tetrachlorure de carbone*, thesis, Paris, Presses modernes, 1938) speaks of nervous forms with polyneuritis following the development of a hepatorenal type of poisoning, but his list of cases does not include any such case as the one mentioned.

If all other possible causes can be excluded and symptoms and signs persist, one cannot exclude the possibility of carbon tetrachloride exposure being the exciting cause, although this would be extremely unusual.

POSSIBLE MILKERS' NODULES

To the Editor:—Three years ago a young single woman spent her vacation on a farm and, while milking a cow, scratched the palm of her hand with her fingernail. The next few days she noticed a blister over this area of the palm of the hand which formed an ulcer the size of a quarter (24 mm.) and was moderately painful and would not heal readily. Her other hand also became ulcerated, although to a lesser degree. She was not acutely ill and was under a physician's care for three months. Numerous cultures and blood tests were taken with no informative results. Finally, roentgen rays were used, and, after several treatments, the ulcer of the palm healed with only a slight scar. Since then she has occasionally noticed soreness and pain about the axilla and breast on the same side. She has also noticed a tender lump in the breast the size of a small marble at such times. On about five occasions in the past three years she has felt "out of sorts" but not actually sick, and this condition would clear up by the eruption of symmetrical bluish red blotches on the palm of the hands and outer aspect of the soles of the feet. The only subjective symptoms would be the burning of the hands and feet and soreness of the outer aspect of the breast with definite nodules resembling a "caked" breast. This would involve only the breast on the same side as the original ulcerous lesion of the palm of the hand. The patient has no fever or axillary adenitis, the blood count is normal, and there is no other evidence of a cutaneous lesion except acne of the face. In summary, the salient points are as follows: 1. History of ulcer of palm of hand three years ago; persisted three months; responded to roentgen ray treatment. 2. Symmetrical eruption of the palms and the outer aspect of the feet; lasts about one week; preceded by malaise; subjective symptom burning, blotchy red in character and not raised. 3. Lumpy, tender breast on the side of the primary lesion of the hand with soreness and tenderness along the outer border of the pectoral muscles. I should like an opinion as to diagnosis or further work-up.

M.D., Illinois.

[This question has been referred to a surgeon and to a dermatologist, whose replies follow.]

ANSWER.—Two possibilities suggest themselves with reference to this case: first, infection of the open wound of the hand with cow hair and subsequent involvement of the axilla and breast with cow hair infection; second, the development of so-called milkers' nodules. The latter seems the more unlikely because of the absence of the characteristic lesions on the hand which are usually seen. Both of these conditions, however, are so uncommon that possible variations in the clinical picture may not be well recognized.

The only suggestion one could make as to further study would be an excision of the nodule in the breast and careful pathologic and bacteriologic study of the tissue removed. One would be reluctant, however, to advise such excision if there is diffuse involvement of breast tissue. As it is worded, the query makes it difficult to visualize the condition of the breast, for the writer first mentions a tender lump in the breast the size of a small marble and subsequently definite nodules resembling a "caked" breast.

ANSWER.—A blister on the palm developing a few days after an injury of this part during milking and followed by ulcers of both palms, suggests a milkers' nodule infection. Jenner knew this disease in 1799 and called it "false cowpox," and it has been frequently reported and studied in Europe; but the first American report was made recently by F. T. Becker (*Milkers' Nodules*, *THE JOURNAL*, Dec. 21, 1940, p. 2140). The sterility of cultures and the earlier healing of the second ulcer (implied in the failure to mention it again) as well as the mildness of the symptoms would be in agreement with this theory. The persistence of the primary ulcer is against this, for the lesions of milkers' nodules are self limited and followed by an immunity. The disease causes a granulomatous reaction in the skin, however, and this may have been accentuated by local irritation.

The recurrent attacks of malaise followed by a macular eruption on the palms and soles may be a toxic erythema of the multiform type. The generally held idea of this disease is that it is due to toxins or showers of organisms released from a focus of infection which has undergone an exacerbation. Keil (*Erythema Multiforme Exsudativum* [Hebra]: A Clinical Entity Associated with Systemic Features, *Ann. Int. Med.* 14:449 [Sept.] 1940) excludes from this disease the toxic eruptions due to gonococcal infection, rheumatic fever and lupus erythematosus and thinks that true erythema multiforme is an entity. He doubts the likelihood of a tuberculous or streptococcus etiology and favors the idea that it is another of the virus diseases. In support of this theory he mentions epidemics of erythema multiforme simultaneously with epidemics of herpes zoster. He quotes Urbach's series of 20 cases in which herpes labialis preceded the eruption of erythema multiforme by eight days. The sequence of milkers' nodules and erythema multiforme, assumed in the case under discussion, fits this theory. The tenderness in the axilla and breast on the side of the original ulcer, with a small lump during the exacerbation of erythema, suggests a possible focus in this region.

Unless accurate causation can be established, the treatment should be symptomatic.

PSYCHOMOTOR EPILEPTIC ATTACKS

To the Editor:—A man aged 42, an attorney, was in an automobile accident in September 1933. He was unconscious for five or ten minutes. His head was hit, as he states that his cheek was sutured for a minor laceration (three sutures). One month after the injury a discharge from the ear began and two months after the accident he had a grand mal attack (the first in his life). The ear condition (which also had never been noted before by the patient) was diagnosed as a chronic suppurative otitis media, with necrosis of bone. It has been treated conservatively; the discharge subsided completely in two or three years, has never recurred and does not bother him. He visits an otologist once or twice a year, and the perforation and necrosis persist, though he is symptom free. After the first convulsion he was thoroughly studied, although an encephalogram has never been done. A roentgenogram of the involved mastoid was reported as "dense and sclerotic." A spinal fluid Wassermann (and blood Wassermann) test, blood chemistry, urine, blood count and roentgenogram of the skull were all normal. Since the first convulsion he has had a total of twelve attacks, all nocturnal, at intervals varying from the shortest of one month to the longest of twenty-five months. Each attack has been followed by violent retching and emesis; some attacks have been followed by profuse catharsis; most attacks were typical, but some were in the form of sleepwalking. He has been under my care for about a year. Till then he had taken no medication. I put him on phenobarbital, 0.1 Gm. at bedtime. Since then the last attack occurred, in November 1940; I then advised him to increase the phenobarbital to 2 grains (0.13 Gm.) at bedtime. There have been no attacks since. Now since he has been reading the literature, he would like to change to phenytoin sodium. I am reluctant to recommend this, in view of the infrequency of the attacks. He admits that it is only occasionally that he feels "sleepy" or "dopy" in the daytime. Would you advise a change to phenytoin? Is its value as unquestionably superior to phenobarbital as the literature states? If I did recommend the change, I was thinking of doing it this way: for the first week, $1\frac{1}{2}$ grains (0.1 Gm.) of phenobarbital and $\frac{1}{2}$ grain (0.03 Gm.) of dilantin; the second week, 1 grain (0.06 Gm.) of each; the third week, $\frac{1}{2}$ grain of phenobarbital and $\frac{1}{2}$ grain of phenytoin and after that 2 grains of phenytoin. Do you approve of this method? Your advice will be greatly appreciated; also any comments on the case in general or other therapy.

M.D., New York.

ANSWER.—Phenytoin is unquestionably superior to phenobarbital, especially in the treatment of psychomotor epileptic attacks. It is often necessary to combine it with small doses of phenobarbital in the treatment of grand mal attacks. It is least successful in petit mal. In a case such as that described, 0.1 Gm. of phenytoin twice a day, morning and night, would be advisable. The addition of 0.016 Gm. of phenobarbital at night is recommended. Owing to the infrequency of the attacks and their fairly adequate control with phenobarbital, there is no necessity for changing to phenytoin. The change, however, might be worth while. Gradual diminution of the phenobarbital is distinctly advisable in changing to phenytoin.

Because of the history of trauma and later of mastoid infection, a pneumoencephalogram might reveal a focal lesion, the removal of which might be beneficial. Any localizing phenomena in the seizures would indicate such a procedure.

KERATOCONJUNCTIVITIS SICCA

To the Editor:—A white woman aged 50 came to the hospital complaining of a white thick secretion in both eyes, which gradually works around over the cornea and feels like a foreign body. Apparently it is secreted by the glands of the lids. It is tenacious and white. A smear showed only strings of mucus. Culture at this time showed *Staphylococcus albus*; the patient says that five years ago a culture showed streptococci. Together with this she also has a secretion from the parotid gland which she squeezes out through the duct. A smear of this shows polymorphonuclear leukocytes and gram positive diplococci with occasional short chains. The condition of the parotid gland does not cause any trouble.

Raymond H. Goodale, M.D., Worcester, Mass.

ANSWER.—From the description, one can be almost certain that the patient has keratoconjunctivitis sicca. This is due to atrophy of the lacrimal glands and is accompanied by atrophy of the salivary glands. The secretion is chiefly desquamated epithelial cells, which appear so when the lacrimal secretion is deficient. The Schirmer test would determine the lacrimal function. Strips of Whatman number 41 filter paper 5 mm. wide and 35 mm. long are cut. The upper 5 mm. is folded so as to hook over the lower lid at the junction of the outer and middle thirds. If less than 15 mm. of the paper is moistened after five minutes, a deficiency is present. Treatment is by affording a substitute for tears. Locke's solution to which is added 4 grains (0.26 Gm.) of gelatin and 3 grains (0.2 Gm.) of chlorobutanol per ounce is satisfactory and should be dropped in the eyes six to eight times a day to the exclusion of all other antiseptics.

If less than 5 mm. of the paper is moistened, it is safe to close all the tear points with the diathermy needle. This allows all the tears to remain in the conjunctival sac and affords great relief. Secretion of the glands may in a few cases be stimulated by small doses of prostigmine bromide by mouth.

PROLAPSE OF THE RECTUM IN THE ELDERLY

To the Editor:—Please inform me regarding the newest treatment of rectal prolapse. The patient is 70 years old.

M.D., New York.

ANSWER.—Prolapse of the rectum in older persons may be of two types. The mucosal type of prolapse, in which the lower portion of the bowel protrudes at stool, can be treated effectively by segmental removal of four or five of the most prominent areas prolapsing. This leaves longitudinal scars which support the bowel and give most patients practically complete relief. The other type of prolapse is one in which the whole lower segment everts, coming out as large as an adult fist. This includes all layers of the bowel. This requires an operative management known as the Rehm Delorme procedure, which involves the removal of the mucosa of the prolapsing segment and the plication of the muscularis of the bowel and a narrowing of the sphincter muscles. This is depicted in Lewis's or Nelson's Surgery. In patients with a prolapse of 6 inches to a foot of bowel, an abdominal operation is necessary, which includes obliteration of the cul-de-sac of Douglas and attachment of the prolapsing segment of bowel to the tendon of the psoas minor muscle.

THE "THREE DYE" TREATMENT OF BURNS

To the Editor:—What is the value of the "three dye" treatment of burns, described by Devine (1 per cent gentian violet, 1 per cent brilliant green and 0.1 per cent acriflavine base)? Is this method as good as or is it better than the usual tannic acid treatment.

Leopold Schwartz, M.D., Wildwood, N. J.

ANSWER.—The advantages claimed for the "three dye" treatment are its antiseptic action against both gram-positive and gram-negative organisms, the relief of pain, and the rapid formation of an eschar. It is difficult, if not impossible, to evaluate satisfactorily by the statistical method the claims made for various treatments of burns. It must be remembered in the treatment of any burn of severe degree that the local lesion is only part, although an important part, of the clinical picture and that in the early stages the treatment of the patient's general condition takes precedence over any special treatment of the wound beyond its protection by sterile covers. As an emergency, and particularly in the treatment of small and minor burns, the three dye method has much to recommend it, particularly the cheapness and stability of the solution.

AUTOAGGLUTINATION OF RED CELLS

To the Editor:—A patient with pernicious anemia has agglutination of the erythrocytes when I try to do an erythrocyte count, thus giving an inaccurate count. Could you suggest the reason and remedy for this?

Earl D. Cumming, M.D., East Cleveland, Ohio.

ANSWER.—Since agglutination of the red cells is rare in pernicious anemia, its occurrence in this case should make one question the correctness of the diagnosis. Three other conditions should be suspected: hemolytic anemia, multiple myeloma and leukemia. In hemolytic anemia the presence of an autoagglutinin may be the cause of this phenomenon. Occasionally a macrocytic blood picture may be present which simulates pernicious anemia. The diagnosis should be confirmed by a red cell fragility test. In multiple myeloma and leukemia, agglutination of the red cells is often produced by an increase in the globulin content of the blood. These conditions must be ruled out by further study of the blood smears and sternal marrow.

If the diagnosis of pernicious anemia is correct and has been confirmed by a favorable response to liver therapy, the cause of the agglutination is probably the presence of an autoagglutinin. An attempt to eliminate the autoagglutination should be made by using other diluting fluids, such as physiologic solution of sodium chloride or 3 per cent sodium citrate. Since cold increases the tendency to agglutination, the blood count should be made at body temperature by warming the pipets and the diluting fluids.

PORT WINE NEVUS

To the Editor:—In *The Journal*, August 9, page 496, in answer to a question concerning the treatment of a port wine nevus, it is said that there is no satisfactory method of treatment. It is now known that in small localized port wine nevi reasonably satisfactory results can be obtained with large but safe doses of Grenz ray. The case discussed in the August 9 issue undoubtedly could not be treated satisfactorily, but I think it should be mentioned that in the smaller type of lesion a satisfactory result can now be secured.

Cleveland J. White, M.D., Chicago.

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THE TOXEMIAS OF PREGNANCY AND THE MANAGEMENT OF PARTURITION

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In this paper we will present the classification of the toxemias of pregnancy adopted by the American Committee on Maternal Welfare, consider briefly the pathogenesis of the acute and chronic diseases which are included in the hypertensive group of toxemias and review the results obtained by applying this concept of these toxemias and their classification in the management of parturition in our cases complicated by these diseases.

Lack of a uniform terminology for the toxemias of pregnancy influenced the American Committee on Maternal Welfare to appoint a subcommittee¹ to classify these conditions and to define the terms used. At the outset this committee decided that a practical classification must be relatively brief and should contain sufficient descriptive terminology to permit the collection of data. The general term "toxemias of pregnancy" includes several complications of pregnancy; the majority of these have some clinical similarity, but some apparently are not related. For example, vomiting of pregnancy, which may or may not be a toxemia, apparently is not related to the majority of the toxemias of pregnancy, practically all of which are related to acute or chronic hypertensive disease. It was evident that the work of the committee was concerned with defining and establishing a clear distinction between (1) chronic cardiovascular and/or renal disease which affects the patient prior to pregnancy or renal disease which develops in the course of, but is not a result of, the current pregnancy and (2) acute hypertensive toxemias of pregnancy (preeclampsia and eclampsia) that develop during pregnancy and are dependent on, and peculiar to, the pregnant state.

The classification of the toxemias of pregnancy² agreed on by the subcommittee and adopted by the

American Committee on Maternal Welfare at its annual meeting in June 1940 is given as table 1.

Vomiting of pregnancy is apparently not related to the toxemias under consideration and will not be considered herein.

In the group of unclassified toxemias are included those toxemias which, because of insufficient or inconclusive data, cannot be classified in the course of pregnancy or the puerperium, and certain rare conditions such as, perhaps, acute yellow atrophy of the liver, which cannot be placed in any of the other groups.

GROUP A. DISEASES NOT PECULIAR TO PREGNANCY

Cardiovascular and renal diseases not peculiar to pregnancy are classified as toxemias of pregnancy because the underlying pathologic lesion or lesions in each tend to be aggravated in the course of pregnancy, prior to the twenty-fourth week, and they tend to produce symptoms one or more of which simulate those of preeclamptic toxemia and eclampsia. The twenty-fourth week is selected arbitrarily as the dividing line between preexisting disease and acute hypertensive disease in the preeclampsia and eclampsia groups because symptoms of the former group of conditions almost always become evident before the twenty-fourth week, and symptoms of the latter commonly develop after the twenty-fourth week.

The clinical diagnosis of preexisting chronic cardiovascular or renal disease is of sufficient importance in the management of pregnancy to justify a brief review of the symptoms and findings of these diseases.

Chronic Hypertensive Cardiovascular Disease.—This may be mild or severe. In general the criteria of mild hypertension are the absence of vascular changes as indicated by a heart of essentially normal size, little if any change in the arteries of the retina, an elevated systolic blood pressure of less than 160 mm. of mercury, a diastolic blood pressure of 100 mm. of mercury or less after rest, and clinically normal renal function. In many of these cases the evidence of chronic hypertensive disease may be inconclusive prior to pregnancy. In cases of severe or advanced hypertension there is commonly found heart disease or enlargement; there are usually evident changes in the retinal vessels, persistence of systolic pressure of more than 160 mm. of mercury and of diastolic blood pressure of more than 100 mm. of mercury after rest and, occasionally, evidence of impaired renal function.

Nephrosclerosis.—Chronic hypertensive disease is essentially a diffuse process affecting the arterioles of the entire body, and on a purely pathologic basis nephrosclerosis should be placed under this heading. However, in some cases of chronic hypertensive disease

From the Section on Obstetrics and Gynecology, Mayo Clinic.
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1. Committee on Classification of Toxemias of Pregnancy. Dr. E. T. Bell, Minneapolis; Dr. William Dieckmann, Chicago; Dr. Nicholson Eastman, Baltimore; Dr. W. W. Herrick, New York; Dr. Foster S. Kellogg, Boston; Dr. H. J. Stander, New York; Dr. Robert D. Mussey, Rochester, Minn.

2. Published in "The Mother," official publication of the American Committee on Maternal Welfare.

complicating pregnancy the evidence of renal vascular involvement or nephrosclerosis predominates over other systemic vascular manifestations. In addition to hypertension, patients who have nephrosclerosis have albuminuria, usually in moderate degree, commonly are unable to concentrate urine to a specific gravity of 1.020, often exhibit residual evidence of albuminuric retinitis, and, when the condition is advanced, have increased retention of nonprotein nitrogen in the blood. More intra-uterine fetal deaths occur in cases in this subgroup than in cases in which the blood pressure is higher and impairment of renal function is less.

Subheadings under renal toxemia permit the classification of acute and chronic glomerulonephritis, acute and chronic nephrosis, and pyelitis with impaired renal function.

GROUP B. DISEASES DEPENDENT ON, OR
PECULIAR TO, PREGNANCY

Definition of Acute Hypertensive Toxemia (Preeclampsia).—The entire syndrome of acute hypertensive toxemia of late pregnancy (preeclampsia and

TABLE 1.—*Toxemias of Pregnancy*

Group A. Disease not peculiar to pregnancy	
I.	Hypertensive disease (hypertensive cardiovascular disease)
a.	Benign (essential), mild, severe
b.	Malignant
II.	Renal disease
a.	Chronic vascular nephritis or nephrosclerosis
b.	Glomerulonephritis
(1)	Acute
(2)	Chronic
c.	Nephrosis
(1)	Acute
(2)	Chronic
d.	Other forms of severe renal disease
Group B. Disease dependent on, or peculiar to, pregnancy	
I.	Preeclampsia
a.	Mild
b.	Severe
II.	Eclampsia
a.	Convulsive
b.	Nonconvulsive (that is, coma with postmortem findings typical of eclampsia)
Group C. Vomiting of pregnancy	
Group D. Unclassified toxemias	

eclampsia) develops in the course of a given pregnancy. In this sense it is distinct from chronic cardiovascular renal disease, which affects patients prior to the pregnancy. Probably there is an underlying familial tendency toward hypertension among a majority of patients who have preeclamptic toxemia, which often makes it difficult to distinguish acute hypertensive toxemia (preeclampsia) from hypertension present before pregnancy attributable to preexisting mild chronic vascular disease.

The Syndrome of Acute Hypertensive Toxemia (Preeclampsia).—Symptoms of preeclampsia rarely become evident before the third trimester of pregnancy. Arbitrarily, as previously mentioned, toxemia which is recognized prior to the twenty-fourth week of gestation is classified in the chronic group, and toxemia which becomes evident after the twenty-fourth week is considered to be acute toxemia. The occurrence of an occasional exception does not vitiate the general application of this rule. The clinically descriptive terms "mild" and "severe" are useful in designating the degree of severity of preeclampsia. In cases in which

the preeclampsia is said to be mild, the systolic and diastolic blood pressures do not rise higher than 160 and 100 mm. of mercury respectively; as Kellogg³ has stated, the urine should contain less than 0.6 Gm. of albumin per hundred cubic centimeters, and the edema is usually slight or more rarely may be absent. Usually no changes are demonstrable in the retinal arteries. Severe preeclampsia develops in few cases and eclampsia in still fewer. However, there are as yet no certain clinical or laboratory methods of determining the cases of potential eclampsia among cases of mild preeclampsia.

In cases of severe preeclampsia the systolic blood pressure usually is more than 160 mm. of mercury after rest and the diastolic blood pressure is 100 mm. of mercury or higher; ordinarily this condition is associated with the passage of more than 0.6 Gm. of albumin per hundred cubic centimeters of urine. The concentrations of uric acid and sulfates may be increased in the blood. In most cases edema is graded 2 or more on a grading basis of 1 to 4. Usually acute hypertensive changes may be observed in the retinal arteries.

Eclampsia.—Eclampsia need not be described in detail. It is probably the same disease as severe preeclampsia except that it is accompanied by convulsions or, rarely, by coma without convulsions.

Pathogenesis of Preeclampsia.—Examination of patients suffering from preeclampsia and eclampsia usually demonstrates the presence of spasm of the small arteries of the retinas. The data obtained in a study of the retinas in 108 of the cases reported by Mussey⁴ in which preeclamptic toxemia was present indicated that (1) all patients who had a systolic blood pressure of 200 mm. of mercury or more had evidence of acute retinal vascular changes, most of them severe, (2) 90 per cent of the patients who had systolic blood pressure between 170 and 200 mm. of mercury had retinal changes, and (3) only 52 per cent of those whose systolic pressure was less than 160 mm. of mercury had such changes and these changes were predominantly mild. A progressive relationship was demonstrated between higher blood pressure and more severe changes in the retinal arterioles. Moreover, the degree and extent of the spasm of the retinal arterioles were usually directly proportional to the severity of the toxemia.

Addis,⁵ Herrick,⁶ Irving,⁷ Eastman,⁸ Bartholomew and Colvin⁹ and others appear to be correct in emphasizing the role of vascular spasm in the production of the syndrome of toxemia, although the cause or causes responsible for the vascular changes have not been proved. Herrick stated that differences between mild and more severe types of late toxemia are of degree, not of kind, and that the role of the kidney is not fundamental but is dependent on the vascular structure of its

3. Kellogg, F., quoted by Stander, H. J.: A New Classification of the Toxemias of Pregnancy, *Am. J. Surg.* 48: 112-117 (April) 1940.

4. Mussey, R. D.: The Relation of Retinal Changes to the Severity of the Acute Toxic Hypertensive Syndrome of Pregnancy, *Am. J. Obst. & Gynec.* 31: 938-946 (June) 1936.

5. Addis W. R.: Pathogenesis of Eclampsia, *Brit. M. J.* 1: 1103-1106 (May 29) 1937.

6. Herrick, W. W.: Phases of Cardiovascular and Renal Disease Indicating Abortion, *J. A. M. A.* 103: 1902-1906 (Dec. 22) 1934.

7. Irving, F. C.: Vascular Aspect of Eclampsia, *Am. J. Obst. & Gynec.* 31: 466-476 (March) 1936.

8. Eastman, N. J.: The Vascular Factor in the Toxemias of Late Pregnancy, *Am. J. Obst. & Gynec.* 34: 549-556 (Oct.) 1937.

9. Bartholomew, R. A., and Colvin, E. D.: Diagnosis and Occurrence of Toxemia of Pregnancy by Examination of the Unknown Placenta: Study of 100 Cases, *Am. J. Obst. & Gynec.* 26: 909-924 (Dec.) 1938.

glomerular tufts and its copious blood supply as an excretory organ. If it is assumed, then, that in both the nonconvulsive and the convulsive forms of acute hypertensive toxemia of pregnancy there is an underlying general systemic vascular injury, we are prepared to accept the accompanying hypertension as the important and outstanding symptom of this disease. In fact, the appearance of hypertension probably is preceded by functional spasticity of the glomerular, retinal and other arterioles which, perhaps, would not be recognized in its incipience

Late Effects of Acute Hypertensive Toxemia (Pre-eclampsia).—In a broad sense, the degree of severity of acute hypertensive toxemia is measured more by the height of blood pressure than by any other symptom or finding. The permanent generalized vascular damage which may follow acute toxemia also seems proportional to the height of the blood pressure and the length of time the hypertension, or the deleterious factor producing it, is imposed on the vascular system. Follow-up studies, notably by Herrick, Peckham¹⁰ and others have shown that chronic cardiovascular disease or chronic nephrosclerosis occurs among many women as a direct consequence of acute hypertensive toxemia.

CLASSIFICATION OF OUR CASES

The concept of vascular changes in the chronic and acute forms of toxemia of pregnancy, as embodied in the classification, was emphasized by Corwin and Herrick¹¹ in 1927. We have attempted to apply this concept in the management of pregnancy and parturition in 225 cases of toxemia of pregnancy which have come under the care of our staff at the Mayo Clinic during the years 1931 to 1939 inclusive; during this time 4,340 deliveries were conducted

In 216 cases the pregnancies were carried to the third trimester. These cases have been classified according to the symptoms and findings as follows: Of our cases in which the conditions were classified in group A, diseases not peculiar to pregnancy, were 61 of chronic hypertensive disease (hypertensive cardiovascular disease), in many of which mild nephrosclerosis probably was present too and 8 cases of unquestioned chronic vascular nephritis (nephrosclerosis). There was evidence of superimposed acute toxemia in 52 per cent of the cases in these two groups. A diagnosis of glomerulonephritis or nephrosis was not made in any case. Among our cases in which the condition was classed as group B, diseases peculiar to pregnancy, were 55 of mild preeclampsia, 60 of severe preeclampsia and 19 of eclampsia; there were 13 unclassified cases (table 2). These 216 patients had 223 babies, including 7 sets of twins

MANAGEMENT

Toxemias Not Peculiar to Pregnancy (Chronic Hypertensive and Renal Disease).—When definite chronic hypertensive disease or chronic nephritis is known to exist prior to pregnancy or lends itself to diagnosis early in pregnancy, management often differs definitely from that in cases of acute hypertensive toxemia, the symptoms of which appear later in pregnancy. Preexisting chronic vascular disease or chronic

nephritis complicating pregnancy has a tendency toward exacerbation in the first or early in the second trimester of pregnancy, and continuation of the pregnancy usually results in a much more serious condition than that which was previously present and may even cause the death of the mother. In the presence of undoubted cardiovascular renal disease pregnancy should be interrupted; this is done in the interest of the mother, although, if the pregnancy is allowed to proceed, death of the fetus in utero is not an uncommon occurrence.

Nine of our patients in the chronic cardiovascular renal group were subjected to therapeutic abortion and 7 of these were sterilized. The condition of 4 of these patients was classified as chronic cardiovascular disease and of 5 as hypertensive renal disease (nephrosclerosis). The average age of the patients was 37.1 years. They had had an average of five pregnancies each and an average of two and six-tenths living babies at birth. The average maximal blood pressure measured in millimeters of mercury was 189 systolic and 119 diastolic.

TABLE 2—Types of Toxemia of Pregnancy and Incidence of Fetal Mortality in 216 Cases

Type of Toxemia	Mothers Babies		Fetal Deaths	
			Num ber	Per Cent
Chronic vascular disease *				
Mild	24	24	5	20.8
Severe	9	9	4	44.4
Chronic vascular disease with superimposed preeclampsia *				
Mild	13	14	0	0
Severe	23	24	6	25.0
Preeclampsia				
Mild	55	56	2	3.5
Severe	60	62	12	19.3
Eclampsia	19	21	8	38.0
Unclassified	13	13	1	7.6
Total	216	223†	38	17.0

* Includes some cases of nephrosclerosis.

† Includes seven sets of twins.

Because of personal or religious convictions or because they did not have prepartum care, a fair number of patients who had definite general cardiovascular disease or evident nephrosclerosis were carried into the third trimester of pregnancy. Some patients who have so-called occult nephritis, which may not be susceptible to diagnosis prior to pregnancy and some who have mild essential hypertension, may pass through pregnancy without superimposed toxemia; there is little immediate risk to the mother and a fair chance of a living babe.

Preeclamptic Toxemia.—Time does not permit consideration of the treatment of preeclamptic toxemia. In brief, the objects of treatment are (1) to reduce the incidence of acute toxemia and eclampsia, (2) to prevent mild toxemia from becoming severe, (3) to effect improvement in toxemia which has become severe and (4) to shorten the course of the disease, when necessary, by terminating pregnancy. The data submitted in this paper deal only with the fourth object of treatment, the termination of pregnancy and management of parturition.

The probability of survival among babies born to women suffering from severe toxemia is decidedly less

10 Peckham, C. H. The Incidence, Differential Diagnosis, and Immediate and Remote Prognosis of the Toxemias of Late Pregnancy. *J. Michigan M. Soc.* 35: 301-308 (May) 1936.

11 Corwin, Jean, and Herrick, W. W. The Toxemias of Pregnancy in Relation to Chronic Cardiovascular and Renal Disease. *Am. J. Obst. & Gynec.* 14: 783-796 (Dec.) 1927.

than normal; this is especially true of premature babies. Continuation of pregnancy to term, however, may not be in the best interest of the fetus, as it may die in utero if overwhelmed by the maternal disease in the course of more or less severe toxemia. Also, as previously stated, the number of women who suffer from chronic arterial disease and chronic nephritis subsequent to preeclampsia increases in proportion to the height of the blood pressure and the duration of the toxemia. When toxemia is severe and when the patient fails to improve or when, following improvement, there is a relapse, termination of pregnancy is indicated.

Parturition in Cases of Preeclamptic Toxemia.—The management of cases of acute toxemia (preeclampsia) permits of more individualization than does the management of cases of chronic disease, depending on the severity of the toxemia and its progress.

The method which may be employed to induce labor and the management of parturition in cases of preeclamptic toxemia depend on a number of factors, including age, parity, duration of pregnancy, adequacy of the birth canal, condition of the cervix and the severity and duration of the toxemia. Fortunately, in a large number of cases, about half of the cases in our series, the onset of labor occurs spontaneously. If termination of pregnancy appears to be indicated, the optimal time for this termination must be selected carefully; this selection must rest chiefly on the duration and severity of the toxemia and, to a lesser extent, on the period of gestation. The severity of the disease is determined by the usual signs of hypertension, albuminuria and edema, and often, finally, by such symptoms as headache, visual disturbance and epigastric pain. The reliability of chemical examinations of the blood to determine the severity and progress of such toxemia is debatable and, by and large, the degree of hypertension is the best index of the severity of the toxemia. The necessity for induction of labor is rare when the systolic blood pressure is less than 160 mm. of mercury and the toxemia is mild. Pregnancy should

Opinions differ with regard to the value of the information derived from examination of the retinal arterioles in cases of preeclamptic toxemia. In our experience this examination in nearly all such cases reveals characteristic spastic changes in the retinal

TABLE 4.—*Method of Delivery and Fetal Mortality in Eclampsia*

Method	Deliveries	Fetal Deaths
Spontaneous	5	2
Outlet or low forceps	14	6
Mid forceps	0	0
High forceps	0	0
Breech extraction	1	0
Version and extraction	0	0
Cesarean section (placenta praevia)	1	0
Total	21*	8

* Nineteen mothers, two sets of twins Maternal mortality 1 (5.2 per cent); fetal mortality 8 (38 per cent).

arterioles, and repeated examinations will indicate whether the process is stationary, advancing or regressing. Among borderline cases this information has often been the deciding factor for or against termination of pregnancy. On the contrary, in cases of severe preeclampsia treatment should be determined on the basis of clinical severity, regardless of the retinal findings.

The other factors mentioned have similar bearing in cases of severe preeclampsia or eclampsia and will be considered in the management of parturition in the latter condition.

Eclampsia.—Eclampsia demands immediate treatment. It is well known that convulsions usually stop soon after the uterus is emptied. Nevertheless, experience has shown that patients who have eclampsia, in general, are not in favorable condition to withstand operation and that termination of pregnancy by surgical methods is generally inadvisable until the convulsions have been controlled. The degree of maternal risk is influenced greatly by the time and method of delivery. Forceful mechanical means of emptying the uterus are attended by an unduly high maternal mortality. Plass, in a collective review, found that the mortality rate following radical treatment was 21.7 per cent in 4,607 cases and only 11.1 per cent in 5,976 cases in which treatment was by the conservative or combined method. Maternal mortality rates of 5 per cent and even lower have been reported in series of cases of eclampsia in which medical measures were used primarily.

The first consideration is to stop the convulsions. During the convulsive state or after its control, measures employed should aid elimination, reduce blood pressure and lessen edema. When the convulsions are under control, and particularly following the establishment of diuresis, usually, measures to terminate pregnancy are indicated (table 3). Occasionally, improvement in the condition of the patient is so favorable that these measures may be deferred temporarily. The uterine muscle is irritable in the presence of severe toxemia and eclampsia, and the onset of convulsions is accompanied frequently by the onset of labor. If the onset of labor does not occur spontaneously, often it is possible to induce labor by medical measures. If medical induction fails or if it seems advisable not to delay, the membranes may be ruptured or, more rarely, a hydrostatic bag may be inserted in the lower segment

TABLE 3.—*Mode of Onset of Labor and Number of Fetal Deaths in Cases of Toxemia of Pregnancy*

Mode of Onset of Labor	Mothers	Babies	Fetal Deaths	
			Num-ber	Per Cent
Spontaneous *	109	113	13	15.9
Medical induction.....	37	37	4	10.8
Medical induction failed; spontaneous onset	9	9	2	22.2
Medical induction failed; artificial rupture of membranes.	10	10	1	10.0
Artificial rupture of membranes .	24	25	5	20.0
Bag induction †.	14	16	6	37.5
Cesarean section ‡.	13	13	2	15.3
Total .	216	223§	38	17.0

* One craniotomy for hydrocephalus
† Employed three times in past five years
‡ One trial of labor
§ Total babies included seven sets of twins

be terminated almost always when the pressure is persistently more than 180 mm. in cases of severe non-convulsive toxemia; the decision with regard to termination or nonintervention is more difficult when the toxemia is moderately severe and the systolic pressure remains between 160 and 180 mm. Disproportionately high diastolic blood pressure usually indicates more severe toxemia.

of the uterus. Cesarean section, preferably under local anesthesia, is reserved for contracted pelvis and other obstetric indications or, in rare instances, for example, as in the case of the elderly primipara, when the cervix is firm, long or not sufficiently effaced to justify rupture of the membranes or the insertion of a bag.

As has been pointed out, the termination of pregnancy has a pertinent role in the control of the hypertensive toxemias and also in lessening the fetal as well as the maternal mortality. Onset of labor in 109 of the 216 cases was spontaneous. In this group the fetal mortality, while approaching the average for the whole group, was largely due to such factors as death of the fetus in the uterus before the patient was first observed, abruptio placenta and fetal anomalies.

In cases of severe preeclampsia and eclampsia the babies are usually premature and have always more or less toxemia, which results in an appreciable fetal mortality, no matter what method of delivery is employed (table 4).

METHODS OF DELIVERY

One hundred and eighteen of the 223 babies (53 per cent) were delivered spontaneously. Outlet or low forceps operation was used to deliver 64 babies (29 per cent of the total). Cesarean section was employed thirteen times and toxemia was the primary indication in only one instance. This was a severe case of chronic hypertensive renal disease (nephrosclerosis). Cesarean section may not lower appreciably the fetal mortality in cases of toxemia. Details as to method of delivery are noted in tables 5 and 6.

RESULTS

There were 2 maternal deaths (0.8 per cent) among the entire series of 225 patients. One mother, who had severe preeclampsia superimposed on chronic vascular disease, died of pulmonary embolism eight days post partum; the other, who had eclampsia, came under our care for the first time when she was in a comatose state. She remained unconscious until her death thirty hours later.

The total fetal mortality was 47 (20 per cent of 232 fetuses). If the 9 cases in which pregnancy was

TABLE 5—*Methods of Delivery in Cases of Toxemia of Pregnancy*

Method of Delivery	Babies	
	Number	Per Cent
Spontaneous	118	52.9
Outlet and low forceps	64	28.7
Mild forceps	9	4.0
High forceps	0	0
Breech extraction	16	7.1
Version and breech extraction	2	0.8
Craniotomy (hydrocephalus)	1	0.4
Cesarean section	13	5.8
Total	223*	99.7

* Includes seven sets of twins

interrupted early are omitted, there were 38 fetal deaths among 223 deliveries, a gross fetal mortality rate (stillbirth and neonatal) of 17.0 per cent. Seventeen fetal deaths were the result of previability, that is, the fetus weighed less than 1,000 Gm., dead fetuses on admission, or by gross malformations; this left 21 deaths among babies with some life expectancy; only 15 of these weighed more than 1,800 Gm. The majority of the

mothers of these babies had severe toxemia. Two of these deaths occurred among 13 cases of cesarean section; 1 fetus died in the uterus from abruptio placentae, 1 baby born to a totally diabetic mother who had toxemia lived two days.

TABLE 6—*Cesarean Section in Cases of Toxemia of Pregnancy*

Indications	Cases	Fetal Deaths
Abruptio placentae	3	1
Placenta praevia	1	..
Previous cesarean section for eclampsia elsewhere	2	..
Chronic severe nephrosclerosis *	1	..
Contracted pelvis	1	..
Large fibromyomas (obstructing)	2	..
Diabetes	2	1
Heart disease	1	..
Total	13	2 (15.4%)

* Hysterotomy and sterilization at thirtieth week of gestation. There were no maternal deaths in these 13 cases.

SUMMARY AND CONCLUSIONS

An attempt has been made to treat acute vasospastic and chronic vasosclerotic disease among 225 toxemias of pregnancy by conservative management of pregnancy and parturition. These cases of toxemia have been divided into groups according to the classification of the toxemias of pregnancy approved by the American Committee on Maternal Welfare. In certain cases of severe chronic cardiovascular and renal disease, pregnancy was terminated prior to the period of viability. In practically all cases of preeclamptic toxemia and eclampsia, delivery was effected through the birth canal, in many instances after labor was induced.

Cesarean section is seldom necessary because of toxemia of pregnancy but may be performed for obstetric indications in the presence of toxemia, preferably if the toxemic state is under reasonable control.

Conservative methods of terminating pregnancy in cases of severe, progressive, acute toxemia of pregnancy tend to lessen rather than to increase maternal risk. So-called conservative management of eclampsia prior to the employment of measures to induce labor is accompanied by results which confirm previous reports of others in regard to the management of this disease.

Fetal mortality may be as high as 50 per cent in cases of severe cardiovascular disease with nephrosclerosis as compared to 3.5 per cent in cases of mild preeclampsia and 19.3 per cent in cases of severe preeclampsia. There were no fetal deaths in 13 cases of mild chronic hypertensive disease with superimposed mild preeclampsia.

The classification of the toxemias of pregnancy has at least four fields of usefulness: 1. It supplies a means of displaying in concise form the present combined medical, obstetric and pathologic conceptions of the vascular changes in the toxemias of pregnancy. 2. Its terminology assists in separating chronic cardiovascular or renal disease which was present prior to pregnancy from acute hypertensive toxemia which develops during pregnancy. 3. The termination of pregnancy in cases of severe chronic cardiovascular or renal disease and the management of parturition in cases of acute toxemia of pregnancy may be rationalized on the knowledge of an actual or potential widespread vascular disease. 4. It affords a brief, comprehensive outline for the uniform collection of the data on these diseases.

CHEMOTHERAPY DURING PREGNANCY

DANGER OF FETAL INJURY FROM SULFANILAMIDE
AND ITS DERIVATIVES

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The efficacy of sulfanilamide and its derivatives in the treatment of certain infections has been amply demonstrated. Their use during pregnancy is often indicated, notably in the treatment of gonorrhea and pyelitis,¹ and since these compounds occasionally have serious toxic effects, such as hemolytic and aplastic anemia, hepatitis and dermatitis, it is of interest to explore the possibility of injury to the fetus and the nursing when these drugs are used during pregnancy and the puerperium.

It was shown by Marshall² in 1938 that after sulfanilamide is administered it becomes equally distributed in the tissues with the exception of bone and fat, and that if concentrations are expressed per unit of water it is probably present in equal proportions in all parts of the body. At about the same time a number of reports³ indicated that sulfanilamide readily passes through the placenta and within five hours appears in nearly equal concentration in the fetal and the maternal blood at term. More recently⁴ a case of abortion at five months was recorded in which the drug was found in equal concentration in maternal and fetal blood after administration over a period of ten hours.

Several investigators have likewise demonstrated the excretion of sulfanilamide in the breast milk.⁵ The possibility of injury to the infant feeding at the breast is much less, for only minute amounts of the drug could be obtained in this way. The bulk is excreted in the urine. With the administration of 3.6 to 6 Gm.,⁶ given in divided doses, nearly all the sulfanilamide may be recovered from the urine after equilibrium between intake and output has been established. Little, then, is excreted in the milk. The level of the drug in the milk closely parallels that in the blood. A series of lactating women given 4 Gm. a day was reported by Stewart and Pratt.⁷ They were found to excrete from 4 to 7 mg. in each 100 cc. of breast milk, while the level of the drug in the blood was the same or a little less. A baby taking 400 cc. of milk a day, then, would get only 28 mg. of sulfanilamide. Therapeutic doses

recommended for infants are 300 to 500 mg. a day. Babies nursed by mothers receiving 4 Gm. a day showed only traces of the drug in the blood and excreted in the urine only 1 to 2.6 mg. over a twenty-four hour period. Such babies showed satisfactory gains in weight, an average intake of milk and normal appearance and behavior.

Unless an infant is unusually sensitive to sulfanilamide there is little likelihood of any injury from the amounts of the drug obtained in the milk, and it is clear that the breast milk would not be a practical medium for the administration of sulfanilamide to the infant.

The possibility of injury to the fetus in utero as a result of the administration of sulfanilamide to the mother seems to be a much more likely one, since the evidence indicates that the concentration in the fetal blood is the same as that in the mother's within a few hours after administration.

A study by Harold Speert⁴ showed the effects on rat fetuses of administration of the drug to the mothers in amounts which resulted in concentrations in the blood comparable to those attained in human beings given sulfanilamide therapeutically. The behavior of the rats receiving the drug was no different from that of the control animals, but in 3 of 15 animals given the drug throughout pregnancy, the litters died in utero. Among the experimental animals the litters were smaller and part or all of the animals in many of the litters were stunted. The mortality among the newborn rats, particularly the stunted ones, during the first five days was greater. There was no correlation between the concentration of sulfanilamide in the maternal blood during pregnancy and mortality of the litters, birth weight, size of litters or degree of stunting. These observations are of interest in connection with case 10 in the accompanying table.

Thirteen women received chemotherapy during pregnancy and were followed through delivery. Their courses are summarized in the accompanying table. These patients received 25 to 80 Gm. beginning in the third, fourth, sixth, seventh and eighth months of pregnancy over periods of seven to twenty-four days while under observation in the hospital. One patient 11, received 125.5 Gm. of sulfathiazole over a fourteen day period in the ninth month of gestation. Patient 12 received 9 Gm. of sulfathiazole over a four day period following treatment with sulfanilamide. The maximum concentrations of sulfanilamide in the blood ranged from 5 to 16 mg. per hundred cubic centimeters. The maximum level of sulfathiazole attained was 7.6 mg. Some patients experienced nausea, vomiting, dizziness and fatigue, and in 1 who received 42 Gm. over a period of ten days in the seventh month, the red blood cell count fell from 4,140,000 to 2,800,000 and the level of hemoglobin from 11 to 9.8 Gm. per hundred cubic centimeters. The highest level of sulfanilamide in this patient was 7 mg. per hundred cubic centimeters of blood, found on the third and ninth days. The 2 patients who received sulfathiazole experienced no ill effects. The babies of 12 mothers had no abnormalities which could be attributed to the treatment of the mother. Patient 10 received relatively small doses of sulfanilamide, a maximum of 1.9 Gm. (30 grains) a day, compared with a maximum of 5.2 Gm. (80 grains) received by the others. Treatment was begun in the eighth month and continued to within fifteen days of delivery. A total of nearly 50 Gm. was given over a period of

From the University of Rochester School of Medicine and Dentistry.
1. Bomze, E. J.; Fuerstner, P. G. and Falls, F. H.: Use of a Sulfanilamide Derivative in Treatment of Gonorrhea in Pregnant and Nonpregnant Women, *Am. J. Obst. & Gynec.* **38**:73 (July) 1939.

2. Marshall, E. K., Jr.: Distribution of Sulfanilamide in the Organism, *J. Pharmacol. & Exper. Therap.* **61**:196 (Oct.) 1937.

3. Speert, Harold: Passage of Sulfanilamide Through the Human Placenta, *Bull. Johns Hopkins Hosp.* **63**:337 (Nov.) 1938. Barker, R. H.: Placental Transfer of Sulfanilamide, *New England J. Med.* **219**:41 (July 14) 1938. Adair, F. L.; Hesselstine, H. C., and Hac, Lucile R.: Experimental Study of Behavior of Sulfanilamide, *J. A. M. A.* **111**:766 (Aug. 27) 1938. Lee, A. M.; Anderson, R. C., and Chen, K. K.: Passage of Sulfanilamide from Mother to Fetus, *Proc. Soc. Exper. Biol. & Med.* **38**:366 (April) 1938.

4. Speert, Harold: Placental Transmission of Sulfanilamide and Its Effects on Fetus and Newborn, *Bull. Johns Hopkins Hosp.* **66**:139 (March) 1940.

5. Hepburn, J. S.; Paxson, N. F., and Rogers, A. N.: Secretion of Ingested Sulfanilamide in Human Breast Milk and in the Urine of the Infant, *J. Biol. Chem.* **123**:149 (May) 1938. Pinto, S. S.: Excretion of Sulfanilamide and Acetylsulfanilamide in Human Milk, *J. A. M. A.* **111**:1914 (Nov. 19) 1938. For Breast Milk: Report of Case, F. (March 8) 1939. Hac, Lucile R. Excretion of Sulfanilamide and Milk, *Am. J. Obst. & Gynec.* **38**:14:153 H. C. Breast 1 Pratt⁷

6. Marshall, E. K., Jr.; Emerson, Kendall, Jr., and Cutler, W. C.: Para-Aminobenzenesulfonamide: Absorption and Excretion; Method of Determination in Urine and Blood, *J. A. M. A.* **108**:953 (March 20) 1937.

7. Stewart, H. L., Jr., and Pratt, J. P.: Sulfanilamide Excretion in Human Breast Milk and Effect on Breast-Fed Babies, *J. A. M. A.* **111**:1456 (Oct. 15) 1938.

thirty-seven days. This was one of the early patients, and unfortunately no determinations of sulfanilamide in the blood were made. The mother showed no ill effects from the drug, and at the time of delivery her blood count was normal, 4,000,000 red cells per cubic millimeter and 13.5 Gm. of hemoglobin per hundred cubic centimeters. The baby, a 3,230 Gm. boy, was

cus albus was isolated from culture of the fluid obtained. The baby was transferred to another hospital, where it remained for three months. On the one hundred and fourteenth day of life the blood showed 3,850,000 erythrocytes, 11.8 Gm. of hemoglobin per hundred cubic centimeters and 6,400 leukocytes, with a normal differential count. The infant's development since then

Administration of Sulfanilamide During Pregnancy*

Patient	Month Treatment Was Begun	Age	Parity	Duration of Treatment, Days	Total Amount Given, Gm.	Level of Drug in Blood		Untoward Effects		Type of Infection
						Day of Treatment	Mg per 100 Cc.	Mother	Baby	
1	3d	20	2	7	32.8	2	15.5	Nausea, vomit- ing, dizziness	None	Pyelitis, Bacillus aerogenes
						4	11.5			
						6	16.0			
						8	4.5			
2	4th	23	0	16	50.1	6	7.0	None	None	Pyelitis, Bacillus coli
						16	4.6			
3	4th	43	4	7	27.6	6	4.5	Nausea, vomit ing	None	Cystitis, B. coli
4	5th	21	0	4	16.9	Nausea, vomit- ing	None	Gonococcal cervicitis
5	6th	27	0	7	25.5	4	5.5	Fatigue, dyspnea	None	Pyelitis, B. coli
6	7th	27	1	15	54.6	7	7.5	None	None	Gonococcal cervicitis
						14	6.5			
7	7th	26	1	12 16 †	48.6 26.3	3	5.0	None	None	Gonococcal cervicitis
						7	4.0			
						10	3.2			
						13	3.3			
8	7th	17	0	10	42.1	3	7.0	Red cells fell from 4,140,000 to 2,800,000, and hemo- globin content from 11 Gm. to 8.8 Gm.	None	Pyelitis, B. coli
						6	5.0			
						9	7.0			
						13	0.5			
9	8th	19	0	12	42.8	1	5.2	None	None	Pyelitis, B. coli
						4	7.2			
						7	6.0			
						10	5.0			
10	8th	23	1	16 21 †	28.3 20.4	None Red cells, 4,000,000, and hemoglobin content, 13.5 Gm. at delivery	Erythrocyte count, 2,880,000; hemo- globin content, 49%; severe jaundice	Gonococcal cervicitis
11	9th	32	2	14	125.5 †	4	3.6	None	None	Lobar pneu- monia
						5	5.1			
						6	5.1			
						7	3.6			
						8	7.6			
						9	5.8			
						10	7.4			
						13	3.3			
12	5th	19	0	17	69.0	4	8.2	Nausea, vomit ing	None	Pyelitis, B. coli
						7	6.0			
						13	4.2			
						17	7.2			
13	6th	19	61.5	3	9.5	Nausea, vomit- ing	None	
						5	9.5			
						17	7.2			
						17	7.2			
13	7th	5	90. †	4	4.1	None	None	
						5	7.0			
						9	2.5			
						13	5.0			
						21	5.0			Abscess of lung

* Except where otherwise indicated, sulfanilamide was used, and the patients were under observation in the hospital.
† After discharge from the hospital.
‡ Sulfathiazole.

delivered spontaneously. On the fourth day of life severe jaundice was noted in the boy, and a blood count revealed 2,880,000 red blood cells per cubic millimeter, 7.6 Gm. of hemoglobin per hundred cubic centimeters and 10,600 white blood cells, with a normal differential count. The icterus index on the eighth day of life was 32 units per hundred cubic centimeters. No cause for the anemia and jaundice was found during the twenty-eight days the infant was in the hospital. Beyond a cephalhematoma of moderate size, there was no evidence of hemorrhage. Four days after discharge the baby was admitted to the hospital with acute otitis media. Myringotomy was done on both ears, and Staphylococ-

cus has been normal. Examination at the age of 3 years revealed that the child was normal and well. Lack of a satisfactory explanation for the anemia of this child suggests possible intrauterine injury from the drug. It is of interest that the mother received smaller doses of sulfanilamide than any of the other mothers. This suggests that full therapeutic doses should be given when chemotherapy is used during pregnancy, for it would seem that injury to the fetus is no more likely with large doses than with small ones. This view is supported by the fact that in rabbits there is no correlation between injury to the fetuses and the concentration of sulfanilamide in the blood of the mother.

SUMMARY

Administration of sulfanilamide during pregnancy is not without danger to the baby because of the rapidly attained similarity in levels of the drug in the blood of mother and fetus.

Thirteen mothers received chemotherapy during pregnancy; severe anemia in the infant of one of them at birth suggests fetal injury from sulfanilamide.

It is suggested that full therapeutic doses be given when chemotherapy is used during pregnancy, for the evidence indicates that the likelihood of injury to the fetus is not lessened by giving small doses.

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ACUTE LARYNGOTRACHEOBRONCHITIS

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NEW ORLEANS

Acute laryngotracheobronchitis is necessarily an acute inflammation of the larynx, trachea and bronchi; but because as commonly employed the term refers to a serious involvement of these organs characterized by evident swelling of the mucosa and submucosa and by the formation of a tough, resinous, diphtheria-like exudate, with the production of dangerous dyspnea, various other appellations have been suggested. These, however, have usually been concerned with the etiologic factor, and since this is still undetermined, no definite progress has been made toward a suitable term.

ETIOLOGY

Almost all the pyogenic organisms responsible for acute infections of the upper respiratory tract have been variously reported as the causative agent of laryngotracheobronchitis, but it is generally supposed that the streptococcus is the most frequent agent. Gittins¹ observed a mixed flora in the majority of his cases. Lynch² reported 5 cases in 4 of which pure cultures of *Staphylococcus albus* were made, and it was the predominating organism cultured in the fifth. Holinger³ found infection with *Streptococcus hemolyticus* in about 50 per cent of his cases, with mixed infections in the remainder. He expressed the belief that when the streptococcus cannot be demonstrated it may have been the primary invader but has become overgrown by secondary bacteria. Jackson and Jackson⁴ stated that in more than 90 per cent of cases the infection is due to streptococci, while the influenza bacillus is responsible in 3 to 5 per cent. In all but 1 of our cases, in which a pure culture of staphylococci was made, we have found a generally mixed infection.

Brighton⁵ found the usual variety of organisms but observed that streptococci and staphylococci in symbiosis usually produce the most severe form of infection. Furthermore, he introduced a new theory regarding a

specific etiologic factor. He cited at length the separate investigations of Beach, Seifried and Burnet on laryngotracheitis in chickens. In the study of this disease, it was possible to obtain a filtrate from the tracheal secretion which reproduced the symptoms in chickens only. From this fact it was concluded that the disease is caused by a filtrable virus. Finally, a vaccine prepared from the exudate after filtration appeared to immunize chickens to the infection. As the histologic picture of the disease in chickens is similar to that of human laryngotracheobronchitis, Brighton suggested the possibility of a virus as the cause of the latter and considered that the pyogenic organisms commonly found may be only secondary invaders.

PATHOLOGY

The pathologic changes are essentially those of a severe acute inflammatory reaction, with edema and formation of a membrane as the distinguishing features. Primarily there is congestion of the vessels, with diapedesis of the red cells and even hemorrhage, infiltration of leukocytes, marked exudation of serum and stimulation of the glands. The reactionary swelling is most severe in the subglottic area because of the loose arrangement of its submucosa; while this swelling, especially when pronounced, produces dyspnea, it is the later development of the membrane which causes asphyxia or pulmonary developments.

In the early stages there is a secretion which is thin, serous and not particularly dangerous. When, however, there has developed necrosis of the mucosa and submucosa with destruction of the glands, a brownish, tough, resinous, glazed exudate lines the tracheobronchial tree. It is so sticky that the bronchoscopist in using the bronchoscope can imagine that he is trying to pass a pipe through a gum rubber tube of about the same diameter. This exudate is the feature of the disease which is so often fatal. It may produce partial or complete obstruction of the larynx, the trachea or any or all of the bronchi, and, depending on the location and duration of the obstruction, emphysema, atelectasis, drowned lung or fatal asphyxia results. While pneumonia is not the primary change produced, it may easily supervene as a terminal phenomenon or as a result of mechanical factors.

SYMPTOMS

Despite the gravity of laryngotracheobronchitis the early symptoms may not excite undue apprehension. The patient may appear to be suffering from an ordinary infection of the upper respiratory tract, with more than the usual amount of laryngeal involvement. The temperature is often only moderately elevated. In time, however, the hoarseness becomes more pronounced, and with this development dyspnea begins. While dangerous dyspnea may not occur without adequate warning, it is usually progressive and proceeds to a state of severe respiratory embarrassment, with stridor and retraction of the suprasternal notch, intercostal spaces and epigastrium. At this point cyanosis, a rapid pulse and marked restlessness are present.

When the well established symptoms of the disease have manifested themselves, progress to a fatal termination usually results if active remedial measures are not taken. With the removal of obstructive plugs, many or most of the ominous symptoms disappear, and except for a mild fever the patient may seem perfectly well. They return after a few hours, however, and the cycle

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1. Gittins, T. R.: Acute Laryngotracheobronchitis. *Ann. Otol., Rhin. & Laryng.* 41: 422 (June) 1932.

2. Lynch, R. C.: Potpourri, *Laryngoscope* 34: 753-757 (Oct.) 1924.

3. Holinger, Paul: Acute Laryngotracheobronchitis. *Dis. Eye, Ear, Nose & Throat* 1: 58-62 (Feb.) 1941.

4. Jackson, Chevalier, and Jackson, C. L.: Acute Laryngotracheobronchitis. *J. A. M. A.* 107: 929-932 (Sept. 19) 1936.

5. Brighton, G. R.: *Ann. Otol. Rhin. & Laryng.* 49: 1070-1082 (Dec.) 1940.

continues again and again, but if unconquerable obstruction or exhaustion does not occur the battle will finally be won.

The physical signs in the early stages are those of ordinary bronchitis of the larger tubes, with coarse rales throughout the chest. When the obstructing plugs of mucus begin to form, all degrees of physical signs, from the wheezing and increased resonance of obstructive emphysema to the flatness on percussion and the mediastinal shift of atelectasis, are encountered.

TREATMENT

At the onset of laryngotracheobronchitis, when dyspnea first develops, a croup kettle should be employed and every effort made to maintain a high degree of humidity. This is especially important if tracheotomy is required later, as it is believed that crusting of the tracheal secretions is due to the fact that the inspired air has not been moistened by passage through the nose. Davison⁶ advocated the use of a mechanical humidifier which can maintain a relative humidity of 95 per cent. In conjunction with this he used an oxygen tent. As the mortality in his cases is the lowest reported, his suggestions merit profound consideration.

Since it is not always possible to have an oxygen tent and the need of oxygen seems imperative, oxygen may be given by nasal tube or by a connection to the tracheotomy tube if this has become a necessary fixture. Kernan and Barach⁷ have advocated the use of oxygen and helium for relief of the obstructions in the trachea and bronchi.

Postural drainage as recommended by Galloway⁸ is of particular value in the early stages, before the secretions have become thickened and tenacious.

If the infection persists and subglottic edema becomes progressive, or if the secretions increase in amount and thickness, they are not expelled by the act of coughing. It then becomes necessary to remove them by bronchoscopic aspiration. Should this be required with any degree of frequency, a low tracheotomy is urgently indicated.

Tracheotomy is best done by first inserting a bronchoscope into the trachea and then performing the operation deliberately. A low tracheotomy serves two purposes: it places the larynx at rest, and it facilitates aspiration of the secretions. Aspiration is done by inserting a catheter through the tracheotomy tube. The tip of the catheter should be smooth, so as not to produce trauma to the already inflamed mucosa. It is important to keep the airway as free of secretions as possible. Stagnation and blocking of the smaller bronchioles may be responsible for the development of pneumonia. Frequent suction may be necessary; for this the services of a nurse experienced in the care of tracheotomized patients are invaluable. The proper and judicious use of suction must be left to her discretion, and on this the welfare of the patient may depend. When the secretions become exceedingly thick and gummy or when hard crusts form after tracheotomy, it is necessary to remove them with the aid of the bronchoscope. This is done by passing the instrument through the tracheotomy wound, and when removal is skilfully executed little trauma is produced.

If repeated bronchoscopic aspirations are necessary it is advisable to keep a bronchoscopic set in the patient's room. The advantage of such a precaution is obvious. It has been an additional advantage to have patients with laryngotracheobronchitis hospitalized in a special institution where the senior resident, trained in bronchoscopy, can be employed in an emergency. The removal of gummy secretions and plugs may be successfully accomplished by suction, but the hard crusts constitute a problem. Often they cannot be removed by simple suction. When this is so they must be removed with forceps, and the removal adds to the inflammatory reaction already present. In 1 of our cases bronchoscopic aspiration was performed twenty-nine times when the dyspnea could not be relieved by other means.

While it is agreed that relief of the obstructed airway is of the utmost importance, treatment must be directed also toward combating toxemia. Fluids should be given freely, if necessary subcutaneously or intravenously. Jackson and Jackson⁴ expressed the belief that transfusion is one of the most powerful remedies in the treatment of laryngotracheobronchitis.

Sedatives are contraindicated because of their inhibitory effect on the cough mechanism, and the use of atropine, while still advocated by a few authorities, appears only to add insult to injury by increasing the dryness and thickness of the tracheobronchial secretions. We believe it is worth while to administer an expectorant as long as it is well tolerated.

Solutions for thinning the secretions are not always successful. A preparation of papaya (essence of caroid) has been recommended from time to time, and in 1 of our cases it appeared to have good effect.

It was hoped that sulfanilamide and its derivatives would provide an additional force with which to combat the disease. Because of its infrequency we have not been able to collect sufficient data to form any conclusions relative to the merits of sulfanilamide and its derivatives. Occasionally brilliant results are claimed, but, judging from the few reported cases, they have not been as good as desired. Cultures of material from the trachea and bronchi should determine which drug should be used. As in a few of our cases there was a heavy growth of *Staph. albus* and *Staphylococcus aureus*, we have been interested in the possibilities of a spray of the sodium salt of sulfathiazole, as recommended by Turnbull⁹ for the treatment of sinusitis.

Finally, it is to be remembered that rest is essential for the welfare of the patient, and, while it may be necessary to aspirate the tracheobronchial tree rather frequently, the patient should be kept as quiet as possible between aspirations. Rest is always a requisite for the dyspneic patient, and all unnecessary procedures should be avoided.

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ABSTRACT OF DISCUSSION

DR. HENRY B. ORTON, Newark, N. J.: In my paper presented before the Academy of Ophthalmology and Otolaryngology last October I reported a series of 62 cases with a gross mortality of 28 per cent. Twenty tracheotomies were performed with seven deaths, a mortality of 35 per cent. This series has been augmented by an additional 6 cases during the past year, with no deaths, in 3 of which tracheotomies were performed. I am of the opinion that intubation is not the pro-

6. Davison, F. W.: Treatment of Acute Laryngotracheobronchitis. *Arch. Otolaryng.* 32: 321-330 (Aug.) 1940.

7. Kernan, T. D., and Barach, A. L.: Role of Helium in Cases of Obstructive Lesions of the Trachea and Larynx. *Arch. Otolaryng.* 26: 419 (Oct.) 1937.

8. Galloway, T. C.: Laryngotracheobronchial Obstructions and Their Effects (with Special Emphasis on Laryngotracheobronchitis, Ohio State M. J. 36: 851-854 (Aug.) 1940.

9. Turnbull, F. M.: Intranasal Therapy with Sodium Salt of Sulfathiazole in Chronic Sinusitis, *J. A. M. A.* 116: 1892-1900 (April 26) 1941.

cedure of choice as shown by the following: Intubation alone was performed on 8 patients and only 1 recovered. Tracheotomy alone was performed on 4 patients with two recoveries. With a combination of intubation and tracheotomy which was done in 19 cases, there were fourteen recoveries. With the combination of intubation and tracheotomy, I feel that intubation ties them over until a tracheotomy can be done. Intubation is a deciding factor in causing these dyspneic patients to react from respiratory shock, with the exception that, in the case accompanied by supraglottic swelling, tracheotomy must be done at once. It is my belief that it is the operation of choice and should be done as soon as possible. In making use of the room supersaturated with moisture at 70 F. temperature I placed 21 patients in this room, 16 of whom recovered. I am of the opinion that this form of treatment is a deciding factor in lowering the mortality rate of this disease.

DR. LOUIS H. CLERF, Philadelphia: Cases of acute laryngotracheobronchitis commonly are seen first by the general practitioner or the pediatrician. If they would consider as potential cases of laryngotracheobronchitis every acute upper respiratory or bronchopulmonary infection which is associated with voice disturbances or beginning difficulty with breathing and if appropriate treatment was instituted promptly I believe the prognosis in these cases would be far better than it now is. Many of these patients are brought to the hospital with a history of having been dyspneic for two or three days; there is evident subglottic obstruction and severe toxemia, and the patient is exhausted. If treatment could be instituted early with proper humidification of the air instead of keeping the patient in the customary superheated atmosphere of the average hospital room or ward, the prognosis would be more favorable. Prompt humidification of air and the use of an oxygen tent will often turn the tide promptly. If after a brief period of observation dyspnea does not lessen, I believe one should proceed promptly with tracheotomy and if necessary the employment of solutions through the tracheal cannula to aid in getting rid of secretions. One may use physiologic solution of sodium chloride, sodium bicarbonate solution, sodium perborate solution or others; in some instances I have added a few drops of epinephrine or ephedrine to the salt solution. The nurse should be trained in the care of these patients. The solution should be instilled into the tracheal cannula during inspiration. I prefer to have the patient cough it up whenever possible. If the patient cannot get rid of secretions by this means, aspiration with a small rubber tube through the tracheal cannula may be practiced. Avoid trauma to the tracheal mucosa. Trauma means bleeding; bleeding means more crusting.

DR. FRANK R. SPENCER, Boulder, Colo.: Most of these patients are so seriously ill that they require a tracheotomy. All should be in the hospital. Oxygen with steam inhalations are most helpful. Very tenacious secretion which cannot be expelled by coughing must be aspirated with a bronchoscope. Some can be removed by suction through the tracheotomy tube. Chemotherapy tends to produce a more tenaciously firm secretion in the early stages, and that is when chemotherapy is used. The point I want to emphasize the most is this drying effect of chemotherapy and the necessity of meeting this by steam inhalation with or without tincture of benzoin. The worst feature of the disease is that the secretions are too dry when the patient first enters the hospital. These must not be made any drier.

DR. F. E. LEJEUNE, New Orleans: I thoroughly agree and believe that we should strive to make the general practitioner realize the seriousness of this clinical entity. Unfortunately the general practitioner does not always have at his disposal oxygen tents in which to put these unfortunate little patients. Of course in the larger medical centers oxygen tents are available for them, and in a few cases that I have seen outside of New Orleans oxygen tents were not available, and under those conditions we have to do the best we can, and the next best solution is the croup kettle. I thoroughly agree with Or. Orton and Dr. Clerf that humidification seems to be the solution to this problem, and early humidification is by choice the best thing.

PARACHUTE INJURIES

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This paper is a preliminary survey of the injuries sustained during the first year of parachute jumping. A detailed description of the technic of parachute jumping has not been attempted; however, those phases of jumping that have resulted in injuries will be discussed. We feel that this presentation will clarify the popular belief that parachute injuries are alarmingly high.

All of the available foreign literature was reviewed. An article by René de Gaulejac¹ covered the subject best. De Gaulejac, reviewing the injuries in 1939.

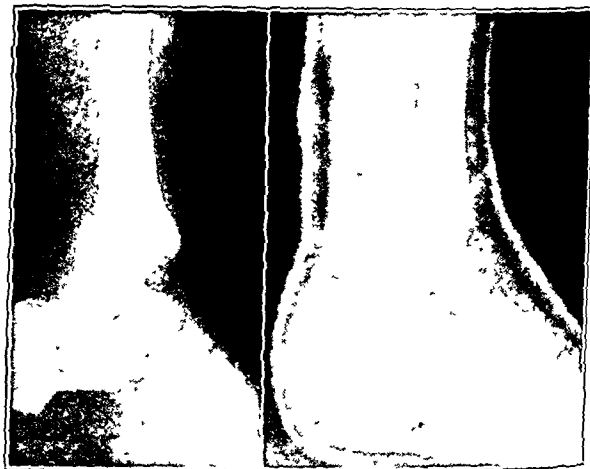


Fig 1.—Posterior dislocation of the ankle joint, seen in 4 cases associated with bimalleolar fractures

classified them into four major groups: (1) injuries which resulted in death, (2) abdominothoracic injuries with or without nervous or vascular complications, (3) various organic lesions with extremely diverse localization and origin, and (4) the more or less complicated injuries of the lower extremities. The lesions of the first group corresponded to the first phase of the jump, where accidents occurred either by entanglement with the plane or by crashing to the earth when the parachute failed to open. The causative factors of the second group included those produced by the shock of the opening of the parachute.

The particular parachute injury referred to by the author developed from 300 to 700 Kg. of shock when the parachute opened. This was sufficient to produce serious injury. The third group of injuries mentioned resulted during the third phase of the jump—after the parachute had opened. Those occurring in the last group resulted in the fourth phase of the jump, at the

From the Orthopedic Department, Station Hospital, Fort Benning, Ga.
The foreign literature was made available through the cooperation of the Army Medical Library, United States Army, Washington, D. C.
The photographs used in this article were reproduced through the courtesy of the 161st Signal Photographic Company, U. S. Army Signal Corps.

The statistics and technical assistance were obtained from the 501st and 502d Parachute Battalions and the Group Parachute School, Fort Benning, Georgia.

1. de Gaulejac, René: Des lésions et troubles organiques imputables aux descentes en parachute, Bull. méd. 53: 258 (April 8) 1939.

period when the jumper came in contact with the earth. At the time de Gaulejac's article was written the French army was experimenting with new varieties of parachutes and harness attachments in order that this shock might be definitely diminished when the parachute opened. It was mentioned that even at that time the necessity was realized for improved types of harness, distributing the shock of the parachute opening over several portions of the body. While no statistics were given, it was implied that there was a large percentage of injuries.

All of our cases have been treated in the usual manner. Statistics were obtained from the personnel department of the 501st and 502d Parachute Battalions and the Group Parachute School. Accurate records have been kept on all injuries since the activation of the Parachute Battalions. It can be seen that there has been a gradual decrease in the number of injuries as improved methods of training have been utilized. The intensive ground training, prior to the actual jumping from the plane, is probably the reason for the relatively small number of injuries.

During the course of ground training there are two types of jumps: the platform and tower jumps. The platform jumps are made from levels of 4, 6 and 11 feet. The 11 foot platform jump has been discontinued during the last few months because several injuries occurred at this unnecessary height. In this phase of training the jumper, with a harness attached, attempts to simulate what actually takes place when he lands during a parachute jump. The student is taught the method of landing in order to take up shock. He is

He is supposed to land with the legs shoulder width apart and the ankles held firmly, but not rigidly, and to fall forward in a roll, so that the shock may be broken at the knees and ankles.

Two types of tower jumps are used. One type is known as the harness or control tower jump. Here

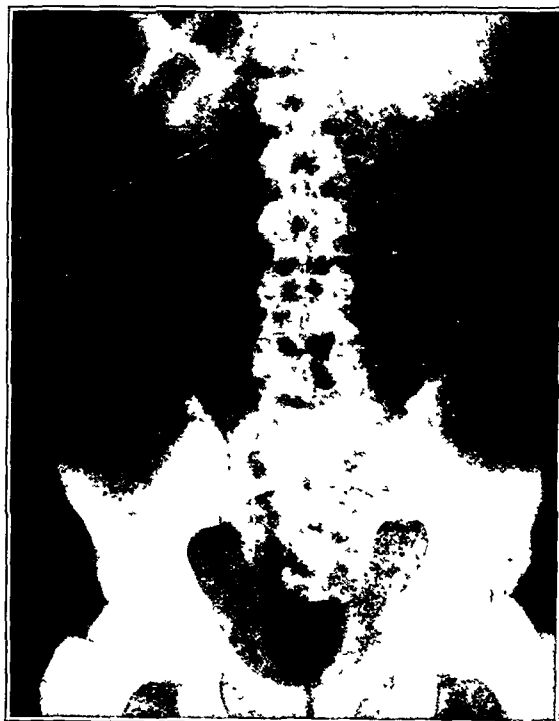


Fig. 3—Same case as figure 2 after reduction under general anesthesia. Good functional result obtained

the student is attached to the harness with an open chute controlled by cables. He is allowed to fall through 250 feet and lands on a rubber steel spring mattress. The other is known as the free tower jump, in which the rider is hoisted to an elevated tower of 250 feet in an open chute and then dropped. This exactly simulates a parachute jump. Following the ground training, the pupil is then ready for a jump.

DATA

From Aug. 1, 1940 to Aug. 1, 1941 there have been four thousand, four hundred and ninety parachute jumps and a total of one hundred and twenty-one injuries, or 2.4 per cent. Of these, only thirty-two, or 0.7 per cent, were severe enough for hospital admission. One parachutist, jumping at 750 feet, was killed when his main and emergency parachutes failed to open completely. Jumping at this height has been discontinued, owing to inadequate time that is required for the parachutist to use his second chute. Approximately eight hundred men took part in these jumps, with each man making an average of five or six jumps. Only 1 out of every 4 cases required hospital admission. Eighty-nine cases included such injuries as contusions, bruises and sprains of a lesser degree. An average of from five to six days was allowed for the treatment, and during this period the men were usually removed from duty.

The injuries with which we are now directly concerned number thirty-two. Twenty-five, or 78 per cent, of the patients admitted had sustained fractures. No

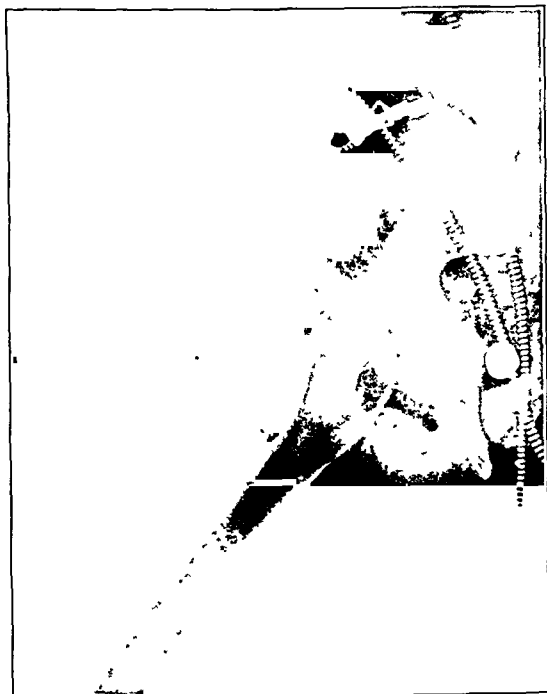


Fig. 2—Anterior dislocation of the hip joint due to sudden pull of an emergency parachute opening in midair. The parachutist was accidentally caught on the tail of the plane when his main parachute opened prematurely.

instructed to land equally on the balls of the two feet, so that the shock may be partially absorbed. The shock of landing is transmitted through the ankles, legs, knees and hips. If the procedure is carried out correctly, there is minimal danger during the landing phase.

compound fractures were seen. Ten of the fractures occurred in the region of the lower third of the tibia and fibula. One was of the internal malleolus alone; four included the internal and external malleoli, all complicated by posterior dislocation of the ankle joint (fig. 1). The remaining five were of the external

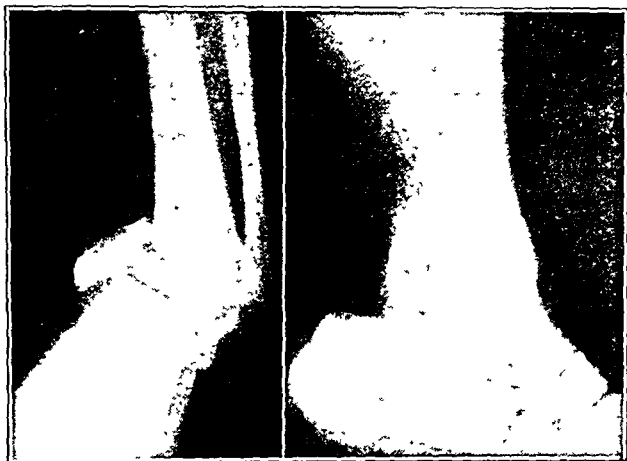


Fig. 4.—Severe medial dislocation of the astragalus associated with bimalleolar fracture

malleoli. These malleolar injuries totaled 40 per cent of the fracture cases. There were 2 cases of fracture of the middle third of the tibia and fibula (8 per cent); one involved the lateral condyle of the tibia (4 per cent); one fracture of the os calcis complicated by fractures of the scaphoid, cuboid and metatarsals (4 per cent); one chip fracture of the lateral portion of the astragalus (4 per cent); four fractures of the metatarsals and phalanges (16 per cent); two fractures of the clavicle at the junction of the middle and outer thirds (8 per cent); one chip fracture of the lateral condyle of the femur (4 per cent), and one fracture of the surgical neck of the humerus (4 per cent). There was one anterior dislocation of the hip joint (figs. 2 and 3). Five patients were admitted for sprains, four in the ankle joint and one in the knee joint. One patient in this series sustained a complete tear of the short head of the biceps and the coracobrachialis muscle, the result of a direct trauma to this region of his arm by the static line which is attached to the plane for the automatic opening of the parachute. The static line in this case became entangled in the jumper's axilla as a result of incorrect connection of the static line.

Twenty-two injuries resulted in the tower jumps, four from free tower jumps and two from platform jumps. The four injuries resulting from the free tower jumps included a fracture of the os calcis, cuboid, scaphoid and metatarsals in 1 case, a clavicle in another, and internal and external malleoli with dislocation of the ankle joint in the third. The injuries sustained in the platform jumps were of minor nature. They included an incomplete fracture of the radial head and a sprain of the ankle joint.

CAUSE OF INJURY

All the injuries except two occurred during the last phase of the jump, or the time when the jumper made contact with the ground. There are multiple factors which may cause such a casualty, and those present in our cases included cross wind currents, uncontrolled oscillations and irregularities of the terrain. It can be

seen that either a combination of these factors or varying degrees of each one may result in different degrees of injuries.

The wind is the main hazard to the jumper. For example, if the cross wind currents are strong, the increased oscillations will cause the parachutist to strike the ground unevenly. Now if one of the ankles should hit the ground first and the wind is on the parachutist's side, a violent sheering force may be developed sufficient to break both malleoli of the ankle joint. Three cases occurred in this manner. Oscillations may also result from inexperience on the part of the parachutist handling the risers. The wind currents within 200 feet of the ground are the most dangerous, because at that level the parachutist must prepare to land. The irregularities of the terrain also constitute a definite factor in the production of these injuries, for if one foot lands at one level and the other at a lower or higher level there results an unequal distribution of weight.

TREATMENT

The treatment of all fractures consisted in closed reduction and adequate immobilization, with the exception of 1 case in which there were comminuted fractures of the internal and external malleoli and lateral and posterior displacement of the ankle joint and an open operation was necessary. A vitallium nail was used to maintain the malleoli in position (figs. 4 and 5).

One case was sufficiently interesting to be recorded in more detail, both because of the nature of the injury and because of the factors causing this injury. This parachutist jumped in the usual manner from a plane traveling at approximately 120 miles an hour, and as



Fig. 5—Same case as figure 4 following open reduction and fixation with a vitallium nail. Good functional result obtained. Put on a permanent nonjumping status.

his chute prematurely opened it became hooked on the tail of the plane, and he remained suspended in this position for almost ten minutes. In this period he was spun around at a terrific speed, and just before losing consciousness he had the faculty of mind to open his emergency chute. The opening of the emergency chute had sufficient force to tear him away from the plane and in so doing violently wrenched his left

hip joint. It is possible that the anterior dislocation of the hip joint which he sustained may have occurred at this time. When seen in the emergency room, the patient's lower extremity was lying in abduction and exaggerated external rotation. After the administration of a general anesthetic, the hip joint was reduced by manipulation and immobilization maintained by bandaging his lower extremities together. The patient was up and about in three weeks, and at the last examination, or sixteen weeks following the injury, he had practically no pain, and a moderate degree of limitation of motion in his hip joint.

CONCLUSIONS

The number of injuries incident to parachute jumping from Aug. 1, 1940 to Aug. 1, 1941 have been surprisingly small. The percentage of injuries has decreased during the latter months of parachute jumping, and it is felt that the decreasing number of injuries can be attributed mainly to the improved methods of preliminary training.

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SARCOIDOSIS, OR BESNIER-BOECK-SCHAUMANN DISEASE

THE FRANK BILLINGS LECTURE

WARFIELD T. LONGCOPE, M.D.

BALTIMORE

Only within comparatively recent years has the important observation made by Schaumann¹ in 1914 been fully appreciated. He showed then that the lesions of the nose, the ears and the fingers described in 1889 by Besnier² as lupus pernio and the disease affecting the skin, the mucous membranes and the lymph nodes which Boeck³ in 1899 termed sarcoid are the same. He pointed out further that the tonsils, the lungs, the bones and the internal organs are involved in the process and concluded, therefore, that the disease is or may become a generalized one. He found the pathologic lesion to be the same in all organs, and since it involved lymphoid tissue he termed the disease lymphogranuloma benignum to distinguish it from Hodgkin's disease, or lymphogranuloma malignum. Since Schaumann's time the disease has been redescribed under a number of names. Kuznitsky and Bittorf⁴ in 1915 directed attention to the pulmonary lesions. Jungling⁵ in 1919 described the remarkable alterations in the bones under the term osteitis tuberculosa multiplex cystica, and since 1936 it has generally been recognized that the condition

recorded by Heerfordt⁶ as early as 1909 as febris uveoparotidea subchronica is one form or one phase of benign lymphogranuloma, or Besnier-Boeck-Schaumann disease, namely sarcoid.

This disease appears in a great variety of clinical forms, and, partly because of this fact, the literature on it has reached enormous proportions. In spite of innumerable contributions the cause of sarcoid, its relation to tuberculosis, its pathogenesis, its treatment and the manner by which recovery ensues remain matters of controversy and dispute. Extensive reviews and discussions of these matters are to be found in the writings of Schaumann,⁷ Kissmeyer,⁸ Pautier,⁹ the contributors to the *Réunion Dermatologique* 1934,¹⁰ Longcope and Pierson,¹¹ Pinner,¹² Hunter¹³ and Snapper.¹⁴

For many reasons the disease attracts attention and presents features of great interest. It can no longer be considered a rarity.

Since publication of the article by Pierson and Longcope¹¹ in 1937, my associates and I have recognized 23 new cases of sarcoid in the medical clinic of Johns Hopkins University School of Medicine and the Johns Hopkins Hospital, so that it is possible to review briefly in this paper the observations made on 31 patients, 5 of whom have died. Four autopsies have been performed by Drs. Vandergrift, Gregory and Roth. A complete study of the pathologic changes is to be published later by Dr. Vandergrift. The clinical diagnosis has been made or confirmed in every instance by the histologic examination of a lymph node, a nodule in the skin or the organs at autopsy. The disease occurred in 13 Negro and 5 white men and in 10 Negro and 2 white women. It was therefore seen much more commonly among Negroes than among white persons. The ages of the patients varied from 10 to 51 years.

The pathologic lesions are so distinctive that they can be readily recognized, and since either the superficial lymph nodes or the skin is frequently involved material can usually be obtained for biopsy for histologic examination and accurate diagnosis.

The characteristic pathologic lesion is the so-called hard tubercle. This consists of a microscopic collection of large pale-staining polygonal epithelioid cells forming a mass about the size of a miliary tubercle (fig. 1). The cells are not always concentrically arranged but may be fitted together like tiles in a floor. The clusters of cells appear as naked, palely staining, isolated islands almost always devoid of a peripheral inflammatory zone and without central necrosis. At times, however, there is degeneration of the central cells. Giant cells are not regularly present but are common. They are often extremely large and irregular, showing many pale nuclei and containing peculiar inclusions of various sizes and

From the Medical Clinic, Johns Hopkins University School of Medicine and the Johns Hopkins Hospital.

Read before the Section on Practice of Medicine at the Ninety Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

Dr A Murray Fisher assisted in collecting and studying some of the cases. Dr Alan Woods gave permission to use histories and material from the Wilmer Institute.

Owing to lack of space, this article has been abbreviated for publication in *THE JOURNAL* by the omission of illustrations and other matter. The complete article appears in the author's reprints.

1. Schaumann, J. Sur le lupus pernio. *Mémoire présenté en Novembre 1914 à la Société française de dermatologie et de syphiligraphie pour le Prix Zambaco*.

2. Besnier, E. Lupus pernio de la face. *syndromes fongueuses (scrofulotuberculose) symétriques des extrémités supérieures*, *Ann de dermat et syph* 10: 333, 1889.

3. Boeck, C. Multiple Benign Sarcoid of Skin, *J Cutan & Genito Urin Dis* 17: 543, 1899; Fortgesetzte Untersuchungen über das multiple benignes Sarcoid, *Arch f Dermat u Syph* 73: 71 and 301, 1905.

4. Kuznitsky, E., and Bittorf, A. Boeck'sches Sarkoid mit Beteiligung innerer Organe, *München med Wchnschr* 62: 1349, 1915.

5. Jungling, O. Osteitis tuberculosa multiplex cystica (eine eigenartige Form der Knochentuberculose), *Fortschr. a d Geb der Röntgenstrahlen* 27: 375, 1919-1921.

6. Heerfordt, C. F. Ueber eine Febris uveoparotidea subchronica an der Glandula parotis und der Uvea des Auges lokalisiert und häufig mit Paresen cerebrospinalen Nerven kompliziert, *Arch f. Ophth* 70: 254, 1909.

7. Schaumann, J. Benign Lymphogranuloma and Its Cutaneous Manifestations, *Brit J Dermat* 30: 515, 1924. Footnote 25.

8. Kissmeyer, A. La maladie de Boeck. *Sarcoides cutanées benignes multiples*, Copenhagen, Levin & Munksgaard, 1932.

9. Pautier, L. M. Une nouvelle grande tumeur endothéliale Maladie de Besnier-Boeck-Schaumann, Paris, Masson & Cie, 1940.

10. *Réunion dermatologique de Strasbourg*. *Science spéciale du 12 mai 1934*. *Conservée à l'étude des sarcoides*, *Bull Soc Franç de dermat et syph* 11: 995, 1934.

11. Longcope, W. T., and Pierson, J. W. Boeck's Sarcoid (Sarcoidosis), *Bull Johns Hopkins Hosp* 60: 223, 1937.

12. Pinner, Max. Noncavitating Tuberculosis, *Am Rev Tuberc* 37: 690, 1938.

13. Hunter, F. T. Hutchinson Boeck's Disease (Generalized Sarcoidosis), *New England J Med* 211: 346, 1936.

14. Snapper, I., and Pomphrey, A. W. M. Pseudotuberculosis in Man. Lectures Given in November 1937 at the University of London, Harlem, Decemr I. Bohn 1938.

shapes staining deeply in hematoxylin (fig. 2). These cell inclusions, first described by Schaumann¹⁵ and repeatedly observed since his report as characteristic of the disease, sometimes give the appearance of calcified material.



Fig. 1.—Section of lymph node in a case of sarcoidosis. There is almost complete replacement of lymphoid tissue by solitary miliary sarcoids.

The tubercles themselves appear to remain unchanged for long periods, often years, for lymph nodes that have been enlarged for many months may show exactly the same changes as those that are freshly involved. The solitary “hard tubercles” do not seem to grow in size, but they increase in numbers and may become so profuse that they form large, pearly gray, semitranslucent, firm masses visible to the naked eye, giving the appearance of small tumors in the skin or large masses in such organs as the spleen, the liver and the heart. The solitary hard tubercles heal by a process of fibrosis and hyalinization. The histologic picture on the whole is one of a proliferative rather than of an inflammatory process.

How the disease arises or is distributed is a mystery, but, like Hodgkin’s disease, it may affect any organ of the body and is prone, as Schaumann pointed out, to appear in lymphoid tissue. The extremely wide distribution of the lesions is illustrated by the dissemination observed in 31 cases (see accompanying table). It may be said that the dissemination in these cases is representative of that described in other published data. The lesions have been found in almost every tissue of the body.

Though sarcoidosis at times presents more or less acute phases, the usual lack of constitutional reactions in the presence of extensive disease of many organs is one of its most surprising features.

Fever is not a common accompaniment of the disease. Twenty-one of our patients either did not have fever

or had temperatures that did not exceed 100 F. In 8 instances, however, there was irregular fever during the syndrome of uveoparotitis or in association with acutely progressive stages, during which the temperature varied from 100 to 102 F. There was no loss of weight except in rare instances. Anemia was not often observed, and the leukocyte count was either within normal limits or somewhat below normal, for in 16 of

Distribution of Lesions

	Num-ber Autopsy			Num-ber Autopsy	
Skin.....	16	2	Eyes		
Lymph nodes			Conjunctiva.....	2	..
Superficial.....	20	4	Sclera.....	1	..
Mediastinal.....	4	1	Cornea.....	5	..
Bronchial.....	26	3	Iridocyclitis.....	10	..
Abdominal.....	3	2	Uveal tract.....	13	..
Lung.....	29	4	Retina.....	1	..
Pleura.....	1	1	Choroid.....	2	1
Heart.....	5	3	Optic nerve.....	1	1
Pericardium.....	2	2	(Uveoparotid fever).	7	..
Liver.....	13	3	Testes.....	2	1
Spleen.....	15	2	Epididymis.....	1	1
Kidneys.....	3	3	Spermatic cord.....	1	1
Voluntary muscles.....	2	1	Prostate.....	1	1
Tonsils.....	2	2	Endometrium.....	1	..
Nasal mucosa.....	3	1	Uterus.....	1	1
Ethmoid sinuses.....	1	1	Dura and meninges.....	2	2
Antral sinuses.....	1	1	Cervical cord.....	1	1
Larynx.....	1	..	Pituitary.....	1	1
			Hypothalamus.....	1	1

28 patients the white cell count varied from 3,000 to 6,000. The only abnormality in the differential count was eosinophilia, which occurred with some frequency, for in 11 of 30 cases eosinophils formed 6 to 35 per cent of the cells. The occurrence of eosinophilia has occa-



Fig. 2.—Section of lymph node in another case. There are many giant cells with inclusions.

sioned some comment (Bruce and Wassen¹⁶). The urine has shown no unusual changes.

In the study of patients with sarcoid one is impressed by the fact that symptoms, when they exist, are caused

16. Bruce, T., and Wassen, E.: Clinical Observations of the Course and Prognosis of Lymphogranulomatosis Benigna. *Schaumann, Acta med. Scandinav.* 104: 63, 1940.

15. Schaumann, J.: *Congrès international de dermatologie, Copenhagen, 1930.*

primarily by the mechanical interference with the function of organs rather than by any form of intoxication. When the miliary "hard tubercles," or sarcoids, collect in great numbers, they tend to displace or destroy normal tissues or may even produce tumor-like masses that involve one or several organs.



Fig. 3.—Telerontgenogram of the chest of a Negro woman aged 37, showing miliary involvement of the lung.

Involvement of any or all of the structures of the eye is comparatively common during some stage of the disease. This occurred in 16 of our patients. It is not infrequently the first manifestation of the disease, as in 12 of the 16. In many it was mistaken for tuberculosis or syphilis. In some instances the lesions in the cornea, the iris or the uveal tract may heal, leaving scars and synechias, but too often the sight is destroyed or enucleation is required. Retrobulbar neuritis resulted in blindness in 1 patient; on 5 an enucleation was performed, and in 1 of these both eyes were affected and the disease led to total blindness.

In 7 of the 16 patients disease of the eye formed a part of the syndrome known as uveoparotid fever. In 1936 Bruins Slot¹⁷ first suggested that uveoparotid fever was actually a form of Besnier-Boeck disease, and in the following year Pierson and I came to the same conclusion and included a case of uveoparotid fever among our cases of sarcoid. In the same year Pautrier,¹⁸ Lamy, Mignon and Polacco¹⁹ and subsequently Lesné, Coutela and Lévesque²⁰ and Waldenström²¹ described similar instances. Since then numerous publications have established the identity of the two conditions and much stress has been laid on the frequency with which the structures of the eye are involved by sarcoid.²²

A remarkable type of involvement of the mediastinal and bronchial lymph nodes and of the lungs leads to a second rather distinctive clinical form of the disease.

17. Bruins Slot, W. J.: Besnier-Boeck's Disease and Uveoparotid Fever (Heerfordt), *Nederl. tijdschr. v. geneesk.* 80: 2859, 1936. Bruins Slot, W. J., Goedbloed, J., and Goslings, J. Die Besnier-Boeck-(Schaumann)-sche Krankheit und die Uveo Parotitis (Heerfordt), *Acta med. Scandinav.* 94: 74, 1938.

18. Pautrier, M. L.: Nouvelles remarques sur la maladie de Besnier-Boeck Schaumann Syndrome de Heerfordt, *Bull. et mem. Soc. med. d. hôp. de Paris* 54: 708, 1938; Les lésions oculaires de la maladie de Besnier-Boeck Schaumann (Le syndrome de Heerfordt), *Arch. d'ophth.* 2: 639, 1938.

19. Lamy, M.; Mignon, M., and Polacco, J. Syndrome de Heerfordt; Images radiologiques d'infiltrations micronodulaires des poumons, *Bull. et mem. Soc. med. d. hôp. de Paris* 53: 1621, 1937.

20. Lesné, F.; Coutela, C., and Lévesque, J. Syndrome de Heerfordt, forme particulière de la maladie de Besnier-Boeck Schaumann, *Bull. et mem. Soc. med. d. hôp. de Paris* 54: 9, 1938.

21. Waldenström, J.: Ueber gutartige, universelle, tuberkuloide Granulome mit besonderer Berücksichtigung der Uveo Parotitis, *Zentralbl. f. d. ges. Tuberk.-Forsch.* 45: 249, 1936.

22. Osterberg, G.: Iritis Boeck (Sarkoid of Boeck in Iris), *Brit. J. Ophth.* 23: 145, 1939. King, M. J.: Ocular Lesions of Boeck's Sarcoid, *Tr. Am. Ophth. Soc.* 37: 422, 1939. Walsh, F. B. Ocular Importance of Sarcoid Its Relation to Uveoparotid Fever, *Arch. Ophth.* 21: 421 (March) 1939. Lindau, A., and Löwgren, A. Benign Lymphogranuloma (Schaumann's Disease) and the Eye, *Acta med. Scandinav.* 105: 242, 1940. Mjølhus, K.: Boeck'sche Sarkoid und Auge, *Ztschr. f. Augenheilk.* 65: 71, 1929.

This is common and occurred to a greater or less extent in at least 28 of our patients. One of the most astonishing features is that in some of these the roentgenogram showed an extensive infiltration of both lungs when there were absolutely no symptoms or physical signs that would suggest pulmonary disease.

Figure 3 is reproduced from the telerontgenogram of a robust, healthy Negress aged 37, who had a few small lesions of the skin and a few palpable cervical lymph nodes. She was entirely without symptoms, and no abnormalities could be detected by physical examination of the chest. Figure 4 shows the microscopic lesions of the lung in a case of miliary sarcoid, and one might imagine that the shadows in the roentgenogram are produced by lesions similar to these. Figure 5 is a reproduction of the telerontgenogram of a Negro woman aged 55 who had one nodule in the conjunctiva and another on the skin of the nose. She was completely symptomless except for the discomfort produced by a nodule in the eyelid, and physical examination of the chest revealed no abnormalities.

Dyspnea is, however, one symptom of this form of the disease, though it occurred in noticeable form in only 7 of our patients. The situation is illustrated by the following instance. Figure 6 shows the mediastinal tumor observed in 1926 in a Negro woman who was then 27 years of age. She complained at that time of dyspnea and cough. There was great enlargement of the cervical and submaxillary lymph nodes, and there were signs suggesting a mediastinal tumor. During the following year she improved on treatment with ultra-



Fig. 4.—Section of the lung in a case of miliary sarcoidosis, showing solitary sarcoids

violet rays. In 1928 during curettage for uterine bleeding sarcoid of the endometrium was observed. Since then she has been well, and during the fifteen years that she has been under observation the shadows in the mediastinum have gradually disappeared, until now the roentgenogram (fig. 7) shows the heart and lungs to be normal.

Figure 8 shows the extensive shadows in the lungs of a white man aged 29, who had no other evidences of the disease than a few enlarged superficial lymph nodes. For three and one-half years he has had increasing shortness of breath, until now he can hardly walk across the room without becoming dyspneic and having an audible stridor. There has been cough without sputum. There is no noticeable cyanosis, and though he has had attacks of dizziness there have been no actual attacks of asthma. He has not had fever, and there has been no loss of weight. The movement of the chest is limited, but the percussion note is everywhere resonant. The breath sounds are diminished and the expiration much prolonged, and there are great numbers of sibilant and sonorous rales. The roentgenogram shows a most extensive involvement of the pulmonary tissue.

With spreading involvement of the lung, secondary pulmonary infections may sometimes arise, causing attacks of bronchopneumonia. Patients with such involvement also seem to be susceptible to tuberculosis, and considerable emphasis has been placed on the association of the two diseases, particularly by those who regard benign lymphogranuloma as a peculiar form

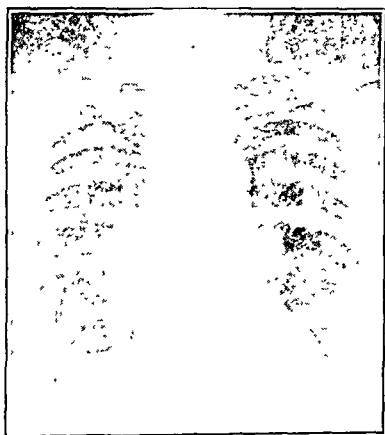


Fig. 5.—Teleroentgenogram of the chest of a Negro woman aged 55, showing involvement of the bronchial lymph nodes.

of tuberculosis. In a certain number of fatal cases death has been caused or hastened by tuberculosis of the lungs or of other organs, for in 6 of 21 recorded autopsies²³ active tuberculosis, usually of the lungs, was noted. Four of our patients, 3 of whom have died, 2 coming to autopsy, had pulmonary tuberculosis. Thus in a total of 25 autopsies, tuberculosis has been observed in 8.

Dyspnea, however, is not always dependent entirely on either primary or secondary disease of the lungs, for the function of the heart may be deranged, either secondarily as a result of extensive infiltration of pulmonary tissue or by direct invasion of the pericardium or the myocardium by sarcoid. Salvesen²⁴ expressed the belief that invasion of the myocardium by sarcoid had occurred, although autopsy was not done, in a case which he reported in 1935, for there was a transient bundle branch block. Since then comparatively little attention has been directed to this phase of the subject. In the extensive reviews by Pinner¹² and Snapper¹⁴ mention was scarcely made of it, and Pautrier,⁹ in his

large monograph, did little more than allude to the occasional involvement of the heart. Schaumann,²⁵ however, has described cases of myocardial failure ascribed to dilatation of the right side of the heart. Cotter²⁶ has recorded a fatal case of sarcoid in a Negro aged 18, in whom symptoms from myocardial failure dominated the clinical picture and in whom at autopsy extensive infiltration of the myocardium was noted. Of the 21 recorded autopsies, sarcoids were observed in the pericardium, in the heart or in both situations in 4;²⁷ and in at least 3 of the cases symptoms referable to myocardial failure were noted during life.

In 5 of our 31 patients some evidence of myocardial damage was obvious during life. Three of these died. Permission was obtained for autopsy on 2, in both of whom more or less extensive invasion of the myocardium by sarcoid was observed. In a sixth patient scattered nodules were observed in the myocardium at autopsy, though during life there had been no symptoms or signs to suggest disease of the heart.

Of the 5 patients in whom forms of heart disease and myocardial failure were observed during life, all had enlargement of the heart. Two came to autopsy, 1 showed extrasystoles, 1 showed abnormalities of the T waves and myocardial failure, 1 who died and did not come to autopsy had persistent bundle branch block, 1 who died and came to autopsy had complete auriculo-ventricular dissociation and 1 patient said to be in good health died suddenly.

Patient 2, a Negro aged 29, who was ill for five years with bilateral uveitis and enlargement of the bronchial and mediastinal lymph nodes, finally showed dyspnea, with weakness and edema of the extremities. There was enlargement of the heart, with diffuse pulsations over the precordium, accentuation of the second pulmonary and aortic sound but no murmurs, though numerous extrasystoles were heard. The blood pressure was 120 systolic and 68 diastolic. Several electrocardiograms showed bundle branch block, with prolongation of the PR interval to 0.26 and 0.28 second. The patient died with the symptoms of myocardial failure, but permission for autopsy could not be obtained.

The third patient, a Negro aged 20, suddenly experienced abdominal pain and nausea. Later there were cough, progressive dyspnea and edema of the feet. He was desperately ill, cyanotic, dyspneic, emaciated and edematous. There were fever, tachycardia and signs of partial consolidation of the middle portion of the right lung, with effusion in the right pleural cavity. The heart was enlarged, and there was a loud systolic murmur at the apex. The sounds were loud. The blood pressure was 120 systolic and 60 diastolic. The cervical veins were engorged; the venous pressure was 370 mm. of saline solution. The abdomen was distended; both the liver and the spleen were much enlarged. The urine contained albumin. The electrocardiogram showed alterations in the T wave interpreted as evidence of myocardial damage and not dependent on the digitalis which the patient had received. He was placed in an oxygen tent and given digitalis. Improvement ensued, and he is now working and symptomatically comfortable, though there are signs of fibrosis of the upper lobe of the right lung.

23. Mylius, K., and Schürmann, P.: Universelle sklerosierende tuberkulöse grosszellige Hyperplasie, eine besondere Form atypischer Tuberkulose. *Beitr. z. Klin. d. Tuberk.* 73:166, 1929. Lenartowicz, J., and Rothfeld, J.: Ein Fall von Hautsarkoiden (Darier-Roussy) mit identischen Veränderungen im Gehirn und den inneren Organen. *Arch. f. Dermat. u. Syph.* 161:504, 1930. Spencer, J., and Warren, N.: Boeck's Sarcoid: Report of a Case with Clinical Diagnosis Confirmed at Autopsy. *Arch. Int. Med.* 62:285 (Aug.) 1938. Berg, S.: Tuberculose anergique ou maladie de Schaumann? *Acta med. Scandinav.* 103:8, 1940. Froehlich, A., and Scherer, H. J.: Zur Kenntnis der visceralen Form der Besnier-Boeck'schen Krankheit. *Gastroenterologica* 65:36, 1940. Hollister, W. F., and Harrell, G. T.: Generalized Sarcoidosis of Boeck Accompanied with Tuberculosis and Streptococcal Bacteremia. *Arch. Path.* 31:178 (Feb.) 1941. Longcope and Pierson,¹¹ Bernstein, Konzelmann and Sidlick,²⁷ Schaumann,²⁵ Tillgren,²⁹ Nickerson.²⁸ Mylius and Schürmann.²³

24. Salvesen, H. A.: The Sarcoid of Boeck: A Disease of Importance to Internal Medicine. *Acta med. Scandinav.* 86:127, 1935.

25. Schaumann, J.: Lymphogranulomatosis Benigna in the Light of Prolonged Clinical Observations and Autopsy Findings. *Brit. J. Dermat.* 48:399, 1936.

26. Cotter, E. F.: Boeck's Sarcoid: Autopsy in a Case with Visceral Lesions. *Arch. Int. Med.* 64:286 (Aug.) 1939. Pinner.¹²

27. Bernstein, M.; Konzelmann, F. W., and Sidlick, D. M.: Boeck's Sarcoid: Report of a Case with Visceral Involvement. *Arch. Int. Med.* 44:721 (Nov.) 1929. Schaumann,²⁵ Nickerson.²⁸ Cotter.²⁷

The fourth patient, a Negro aged 42, was known to have had syphilis and complete heart block for at least ten years. Attacks of Adams-Stokes syndrome had occurred early in the disease and again just before he had been last seen. The heart was enlarged. There was a systolic and diastolic murmur along the left border of the sternum. The pulse averaged 40 beats per minute. The blood pressure was 130 systolic and 80 diastolic. The Wassermann reaction was positive, in spite of seven years of treatment for syphilis. The electrocardiogram showed complete auriculoventricular dissociation, with extrasystoles. The man was considered to have syphilitic disease of the heart with aortic insufficiency and complete heart block. He committed suicide, and at autopsy a large dense scar was seen in the interventricular cardiac septum, with old and fairly fresh sarcoids scattered through the myocardium, pericardium, pleura, lymph nodes, spleen, liver and kidneys. The aorta showed no evidence of syphilitic aortitis.

It is impossible to exclude syphilis as a cause of the myocardial scar, but the only evidence of any active or old disease process was the widely disseminated sarcoidosis.

The fifth and final patient was a Negro aged 40, apparently in good health, who dropped dead on his doorstep. An autopsy by Dr. Vandergrift showed enlargement of the superficial, mediastinal, mesenteric and retroperitoneal lymph nodes. There were large masses about the great vessels of the thorax, with extensive infiltration of the pericardium by similar tissue and nodules in the skin of the penis. Microscopically, the tissue was composed of sarcoids, which in addition were disseminated through the lungs, liver, kidneys, spermatic cords and cerebral dura.

In the 25 remaining patients, examination of the cardiovascular system showed no abnormalities, and electrocardiograms of 6 showed no deviation from the normal. Harrell has recorded electrocardiograms in 8 of his 11 cases. Prominent P waves were present in 2, and flat or inverted T waves were found in 2. There were no cardiac symptoms in these cases.

It would take too long to describe in any detail many interesting clinical syndromes growing out of the involvement of other organs or groups of organs, though reference must be made to the patients reproducing more or less the lupus pernio of Besnier, in which the striking enlargement of the nose, the lesions on the ears and the knotty swellings about the joints of the fingers and toes, with deposits in the phalangeal joints, produce somewhat the appearance of leprosy. Two of our patients showed this syndrome.

In other instances the excessive enlargement of the spleen and the liver has led to the diagnosis of Banti's disease. In 1 of our cases Dr. Firor removed the spleen on account of this similarity. The cause of the splenic enlargement was discovered only after histologic examination of the excised organ. Several of Nickerson's²⁸ cases simulated Banti's disease. In 1 of our patients, an Italian boy of 13, the abdominal lymph nodes reached such huge proportions that they formed great tumors, and the nature of the disease was not discovered until at exploratory laparotomy sections of the nodes were obtained and examined histologically. The condition had existed for four years.

Finally reference must be made to the group of cases in which there was evidence of disease of the endocrine

glands. Tillgren²⁹ has reported a case of diabetes insipidus with sarcoid. At autopsy the pituitary gland was seen to be infiltrated with sarcoid tissue. Roos³⁰ has collected from the literature 4 cases of diabetes insipidus with sarcoid, in 1 of which there was uveoparotid fever. Jersild³¹ has reported a similar case in a boy of 15. We have studied 1 patient with diabetes insipidus who, at autopsy performed by Dr. Vandergrift, was observed to have complete replacement of the pituitary gland, its stalk and the hypothalamus by sarcoid tissue.

Another patient, a Negro aged 29, with involvement of the testicles and the epididymis, showed profound changes in secondary sexual characteristics leading to a condition simulating eunuchoidism.

It is obvious from what has been said that benign lymphogranulomatosis is likely to run a long course, during which relapses, with involvement of different organs and tissues, alternate with quiescent or latent periods. It is partly on this account that the disease may present a surprising variety of clinical syndromes, any one of which may be mistaken for some other specific disease, such as syphilis, tuberculosis or Hodgkin's disease. Though spontaneous recovery eventually takes place in most instances, the relapses may continue for years. In 8 of our patients evidence of the disease had been present in some form for five years or more. In one of these it had been present for nine years and in another for eleven.

Though sarcoidosis is not often attended by the constitutional symptoms common to many infections, yet changes from the normal do occur which are indications of a peculiar reaction of the body to this disease. The appearance of eosinophilia, which is somewhat transient, has already been mentioned. We have not observed the striking increase of the mononuclear cells recorded by some investigators (Harrell, Kissmeyer³). The sedimentation rate is sometimes elevated during the active phase of the disease. It was abnormally high in 7 of 9 of Harrell's cases and in 8 of 12 of our cases in which it was determined.

The cholesterol content was below 200 mg. (130, 158, 188 and 196 mg.) per hundred cubic centimeters in 4 cases and above 200 (238) in 1. The blood calcium content was found by Harrell and Fisher³² to be increased (10.6 to 14.8 mg. per hundred cubic centimeters) in 8 of 10 cases. In 2 of our cases the blood

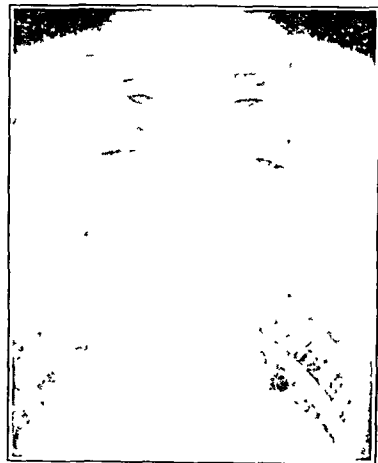


Fig. 8.—Teleroentgenogram of the chest of a white man aged 29. There is extensive involvement of both lungs.

29. Tillgren, J. Diabetes Insipidus as a Symptom of Schaumann's Disease, *Brit J Dermat* 47: 223, 1935.

30. Roos, B. Cerebral Manifestations of Lymphogranulomatosis Benigna (Schaumann) and Uveoparotid Fever (Heerfordt), *Acta med. Scandina.* 101: 123, 1950.

31. Jersild, M. Diabète insipide au cours de sarcoides de Boeck, *Ann. de dermat. et syph.* 10: 641, 1939.

32. Harrell, G. T., and Fisher, S. Blood Chemical Changes in Boeck's Sarcoid with Particular Reference to Protein, Calcium and Phosphorus Values, *J. Clin. Investigation* 18: 687, 1939.

28. Nickerson, S. A.: Boeck's Sarcoid: Report of Six Cases in Which Autopsies Were Done, *Arch. Path.* 24: 19 (July) 1937.

calcium level was 9.5 mg. per hundred cubic centimeters, in 6 between 10.5 and 10.9 mg., in 3 between 11 and 11.3 mg. and in 1 case 16.5 mg. In all but 2 of these 12 cases, therefore, the level of calcium in the blood must be considered as a high normal or above.

A most remarkable alteration is observed in the plasma proteins. This consists in an unusual increase in the globulin fraction, resulting sometimes in a pronounced elevation of the total plasma protein. These changes were reported first by Salvesen,³⁴ who observed them in 3 of 4 cases, and his observations have been repeatedly confirmed (Harrell,³² Bing,³³ Snapper³¹). Determinations of the plasma proteins were made in 18 of our cases by Dr. Mary Buell and her assistants, and the results are graphically shown in figure 9. It will be observed that elevation of the total plasma protein (8.1 to 9.5 Gm. per hundred cubic centimeters in 5 cases) is in general proportional to the increase in the globulin fraction and that even when the value for total protein falls within normal limits, the figures given by Van Slyke and Peters being used as a standard, the globulin fraction is often greatly in excess of normal

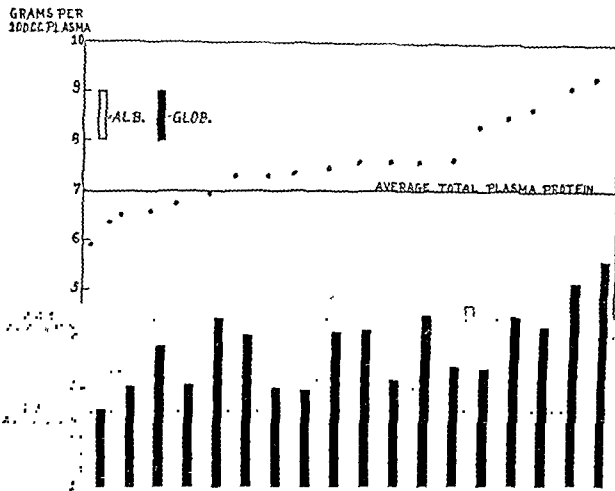


Fig. 9.—Total plasma proteins and the albumin: 18 cases of sarcoid. The total plasma protein: dots, the albumin by the white columns and the globulin by the black columns. The averages are those given by Van Slyke and Peters. (Quantitative Clinical Chemistry: Interpretation, 1931, vol. 1).

and of the albumin fraction. The plasma albumin, on the other hand, shows normal or slightly subnormal values.

The significance of the foregoing data is not clear, but in this particular respect sarcoidosis may be classed with such diseases as multiple myeloma, kala-azar and lymphogranuloma venereum, in all of which an elevation of the plasma globulin is a distinctive feature. Bing,³⁴ who has studied the subject extensively, concluded that an excessive production of plasma globulin is frequently associated with widespread proliferation of the reticulo-endothelium. It is interesting in this connection that Pautrier has designated Boeck's sarcoid as reticulo-endotheliosis.

Since the cause of Boeck's sarcoid, or benign lymphogranuloma of Schaumann, is obscure, we were led because of the noticeable hyperglobulinemia to examine many sections of lymph nodes for Leishman-Donovan bodies or similar structures, with entirely negative results. Sarcoidosis cannot be related to lympho-

granuloma venereum, for Dr. Murray Fisher has made Frei tests on 8 of our patients, with negative results in all but 1. The single positive reaction was obtained in a Negro woman ten years after she had recovered from sarcoid.

The disease is not related to syphilis. Only 5 patients gave a positive Wassermann reaction and 2 a doubtful reaction. Its relation to tuberculosis is still in dispute, and it would be unprofitable at present to explore further this controversial subject. It is, however, necessary to call attention to the rarity with which patients with sarcoid show reactions to tuberculin. This refractory state of the tissues, designated by Jadassohn³⁵ as anergy, has attracted widespread attention, for it has been found that patients with sarcoid are more refractory to tuberculin than are normal persons of comparable age, sex and race (Pautrier). Our experience bears out this general statement, for of 26 cases in which tuberculin tests were performed by the intracutaneous method with old tuberculin, the reaction was entirely negative in 22, there being in 6 no reaction to 10 mg.

Five patients gave positive reactions with amounts of old tuberculin varying from 0.01 to 1 mg., though all but 1 reacted negatively to smaller amounts. Two patients in whom sarcoid was complicated by active tuberculosis gave positive reactions. One other patient who had previously reacted negatively to 1 mg. of old tuberculin contracted pulmonary tuberculosis and then had a positive reaction to the same amount.

Reference has already been made to the fact that active tuberculosis sometimes develops in patients with sarcoid, and it has been noted by several observers that when this occurs the anergy to tuberculin disappears and the patient becomes sensitive to tuberculin. Though no satisfactory explanation has been offered for this anergy, the proposal of Pautrier may well have something in its favor. He suggested that the situation may be analogous to that which occurs in measles and that during the active infection by the causative agent, possibly an unknown virus, the reaction to tuberculin is suppressed and the cutaneous test gives negative results.

From the study of our patients, from bacteriologic examination of the lymph nodes removed during life, from cultures made by Dr. Willis and Dr. Whitehead and from inoculation of tissue into guinea pigs, rabbits and pigeons we have not obtained any evidence to support the view that the disease is caused by human, bovine or avian tubercle bacilli. It is equally true that there is not the slightest clue as to any other cause of the disease, and we are consequently left in ignorance of the cause. The situation in many respects is analogous to that obtaining in Hodgkin's disease.

Without a knowledge of the cause, all methods of treatment are entirely empiric. Various arsenicals, leprosol, tuberculin, roentgen rays, radium and ultraviolet rays have all been employed. We have as a routine method used ultraviolet rays, which appear to be harmless and which, we believe, influence the enlargement of the superficial lymph nodes and lesions of the skin, as in some instances these have receded.

In conclusion it may be said that the disease variously known as sarcoidosis, Besnier-Boeck-Schaumann disease or benign lymphogranulomatosis is a specific disease of unknown cause producing characteristic lesions distinguishable from other infectious granulomas

33. Bing, J.: The Formolgel Reaction and Other Globulin Reactions, *Acta med. Scandinav.* 91: 336, 1937. Footnote 34.

34. Bing, J.: Further Investigations on Hyperglobulinemia, *Acta med. Scandinav.* 103: 545 and 565, 1940.

35. Jadassohn, W.: L'origine tuberculeuse de la maladie de Boeck, *Dull. Soc. franç. de dermat. et syph.* 41: 1344, 1934. Lemming, R.: An Attempt to Analyze the Tuberculin Anergy in Schaumann's Disease (Boeck's Sarcoid), *Acta med. Scandinav.* 103: 400, 1940.

such as those of tuberculosis and syphilis. It runs a chronic relapsing course, producing comparatively mild constitutional symptoms but sometimes causing great damage to many structures. Hyperglobulinemia is a noticeable feature, eosinophilia may at times be present and tuberculosis is prone to complicate the pulmonary forms. Spontaneous recovery is common.

HERPES SIMPLEX FOLLOWING ARTIFICIAL FEVER THERAPY

SMALLPOX VACCINATION AS A FACTOR
IN ITS PREVENTION

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This report is an analysis of the occurrence of herpes simplex¹ as a complication of fever therapy. It is based on the records of 321 patients who were treated at the San Francisco Hospital and at the University of California Hospital.

Our purpose in this investigation is to determine whether the incidence of herpes is influenced by age, sex, disease or degree of the temperature induced during fever therapy, whether one attack of herpes protects against further attacks, what the relation is of individual susceptibility to the development of herpes and whether the incidence of herpes under these conditions is influenced by recent vaccination against smallpox.

REVIEW OF THE LITERATURE

Herpes is a common complication of pyrotherapy.² In most patients the lesions appear twenty-four to thirty-six hours after the first treatment and heal in seven to ten days. The common sites are the lips, cheeks, eyelids and buccal mucosa.

Virus and Virus Immunity.—Warren, Carpenter and Boak³ have shown that the virus found in the herpetic lesions which develop after fever treatment is indistinguishable from the virus in herpes which occurs under other conditions. Various inclusion and elementary bodies in herpes-infected tissues have been described. The intranuclear eosinophilic inclusion body of Lipshutz has been found repeatedly in the herpetic lesions of human beings and experimental animals. The growth of the virus may be observed in the tissue culture of the infected rabbit's cornea and in the chorio-allantoic membrane of the chick embryo.⁴ The virus of herpes is relatively large. Elford, Perdrau and Smith⁵ estimated the size of its particles at between 0.1 and 0.15 millimicron.

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1. Herpes simplex is hereinafter referred to as herpes.
2. Epstein, N. N. The Blanket Method of Inducing Artificial Fever, *Arch. Phys. Therapy* 18: 199-205 (April) 1937. Warren, Carpenter and Boak.³

3. Warren, S. L.; Carpenter, C. M., and Boak, Ruth A. Symptomatic Herpes, a Sequela of Artificially Induced Fever, *J. Exper. Med.* 71: 155-168 (Feb.) 1940.

4. Rivers, T. M., Haagen, E., and Muckenfuss, R. S. Development in Tissue Cultures of the Intracellular and Herpetic Infections, *J. Exp. Med.* 61: 299-312 (1929). Burnett, T. M., Lush, Dora, and Jackson, B. Pseudorabies Viruses on Chorioallantois, *Australian J. Exper. Biol. & Med. Sc.* 17: 35-40 (March) 1939.

5. Elford, W. J.; Perdrau, J. R., and Smith, W. The Filtration of Herpes Virus Through Graded Collodion Membranes, *J. Path. & Bact.* 36: 49 (Jan.) 1933.

Rabbits, guinea pigs and mice are susceptible to experimental infection by the herpes virus.⁶ In these animals active immunity of several months' duration may be produced by inoculation with the live or formaldehyde-inactivated virus. Specific antibodies can also be demonstrated in the serum of these animals by complement fixation, agglutination, precipitation and neutralization.⁷ It has been stated that patients suffering from recurring herpes always possess antibodies to the virus. However, the serum content of antibody does not fluctuate between or during attacks of herpes.⁸ Andrewes and Carmichael⁹ found that a large proportion of the adult population possesses these specific antibodies. Burnet and Williams⁶ stated that herpetic lesions will develop in every person who possesses antibodies and is subjected to a sufficiently severe febrile stimulus.

According to Rivers,⁴ no consistent parallel exists between resistance to the clinical appearance of lesions and the presence of specific neutralizing antibodies in the serum in virus diseases. Administration of serum containing virus-neutralizing properties does not prevent attacks of herpes. An explanation may be that the virus is fixed in the tissue cells and hence is rendered independent of the influence of antiviral serum.¹⁰

Use of Vaccine Virus in the Treatment of Herpes.—In 1925 Gildemeister and Herzberg¹¹ reported that a partial cross immunity existed between the virus of herpes and the virus of vaccinia. On the basis of this observation, smallpox vaccine was applied clinically for the treatment of recurring herpes. However, this work has not been confirmed, and evidence that the viruses of herpes and vaccinia are unrelated has been presented.¹² The continued use of vaccination as therapy for recurring herpes is based on its apparent clinical success. Single and multiple vaccinations with vaccine virus have been reported as effective in decreasing the number of recurrences and in lessening the severity of individual attacks.¹³ Andrews¹⁴ noted that the period of freedom between attacks following treatment varied considerably and that the greater the number of vaccinations the better were the results. None of the clinical studies on the use of vaccination in the treatment of recurring herpes have included control series.

6. Burnett, T. M., and Williams, S. W. Herpes—New Point of View, *M. J. Australia* 1: 637-642 (April 29) 1939.

7. Brann, R. T. Biological Therapy in Virus Disease, *Brit. J. Dermat. & Syph.* 48: 21, 1936.

8. Frank, S. B. Formalized Herpes Virus Therapy and Neutralizing Substance in Herpes Simplex, *J. Invest. Dermat.* 1: 267-282 (Aug.) 1938.

9. Andrewes, C. H., and Carmichael, E. A. Presence of Antibodies to Herpes Virus in Postencephalitic and Other Human Sera, *Lancet* 1: 857 (April 19) 1930.

10. Rivers, T. M.; Haagen, E., and Muckenfuss, R. S. A Study of Vaccinal Immunity in Tissue Cultures, *J. Exper. Med.* 50: 673 (Nov.) 1929. Andrewes, C. H. Antivaccinal Serum, *J. Path. & Bact.* 32: 265 (April) 1929.

11. Gildemeister, E., and Herzberg, K. Immunologic Relations Between Herpes and Smallpox, *Deutsche med. Wchnschr.* 51: 1647-1651 (Oct. 2) 1925, abstr. *J. A. M. A.* 85: 1594 (Nov. 14) 1935.

12. Bedson, S. P., and Bland, J. O. W. Supposed Relationship Between Viruses of Herpes, Febrilis and Vaccinia, *Brit. J. Exper. Path.* 9: 174-178 (Aug.) 1928. Smith, W. Specific Antibody Absorption by the Viruses of Vaccinia and Herpes, *J. Path. & Bact.* 33: 271-282, 1930. Kanazawa, K. Herpes—Question of Immunologic Relationship to Vaccine Virus, Experiments with Mice, *Jap. J. Exper. Med.* 16: 109-115 (June 20) 1938.

13. Freund, H. Beitrage zur Kenntnis von Herpes und Zoster, *Arch. f. Dermat. u. Syph.* 115: 282, 1928. Minami, S., and Ohmichi, N. Klinische Erfahrungen mit Vakzination bei Herpes Genitalis, *Jap. J. Dermat. & Urol.* 30: 54 (May) 1930. Wise, Fred, and Sublerger, M. B. The Year Book of Dermatology and Syphilology, Chicago Year Book Publishing Company, 1934, p. 426. Foster, P. D., and Absher, A. B. Smallpox Vaccine in Treatment of Recurrent Herpes, *Arch. Dermat. & Syph.* 36: 294-301 (Aug.) 1937. Davis, P. L. Recurrent Herpes of Cornea and Recurrent Herpetic Fever: Results of Treatment with Smallpox Vaccine, *J. A. M. A.* 111: 2098-2099 (May 25) 1940. Woodburne, A. R. Herpetic Stomatitis (Afrikaner Stomatitis), *Arch. Dermat. & Syph.* 13: 543-547 (March) 1941.

14. Andrews, G. C., in discussion on Frank.⁸

METHOD OF STUDY

Fever therapy was administered to all patients by the blanket method (Epstein²). The maximum temperature was maintained for a period of five hours. The patients with gonococcal infections received a course of six to ten biweekly treatments. The maximum

Per cent
of patients
with
herpes

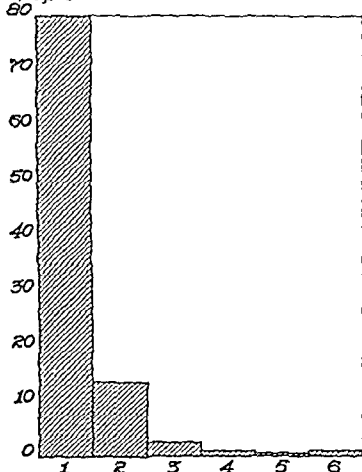


Chart 1.—Incidence of first attacks of herpes in relation to individual treatment.

221 at the University of California Hospital. Each patient received at least three treatments. The patients at the San Francisco Hospital were vaccinated routinely against smallpox at the time of first admission. In this analysis the two groups have been combined for the most part. It is specifically indicated whenever one or the other group is considered separately.

INCIDENCE OF HERPES

Herpes as a sequela of fever therapy appeared in 227, or 70.7 per cent, of the 321 patients, usually one to three days after the first treatment. The lips, nose and inside of the mouth were the areas most frequently affected. The location and number of lesions varied in individual cases. A record of 300 lesions showed the following distribution: lips, 206; nose, 62; inside of the mouth, 19; chin, 15; other parts of the face, 6. No genital lesions were noted.

TABLE 1.—Incidence of Herpes Following Fever Therapy

Hospital	Number of Patients Treated	Number of Patients with Herpes	Percentage of Herpes
San Francisco.....	100	68	68.00
University of California.....	221	159	71.94
Total.....	321	227	70.7

The incidence of herpes following fever therapy was approximately the same in the two groups (table 1). In 80.2 per cent of these patients, herpes developed following the first treatment (chart 1). The high incidence following the first treatment and its sharp decline following subsequent treatments was striking.

During a single series of fever treatments, recurrences were noted in 29.1 per cent of the patients. The incidence of these recurrences was 22.1 per cent in the group at the San Francisco Hospital and 32 per cent

in the group at the University of California Hospital. Not only were there fewer total recurrences in the former group, but the mean number of recurrences per patient was smaller, namely one and six-tenths as compared with two and five-tenths in the latter group.

Among the 39 patients who received two or more courses of fever treatment, the incidence of herpes was more than twice as great during the first course as during later courses (chart 2). The mean lapse of time between courses was fourteen months and the range was from five months to four years.

TABLE 2.—Incidence of Herpes as Related to Disease

Diagnosis	Number of Patients Treated	Number of Patients with Herpes	Percentage of Herpes
Gonorrhea.....	126	79	62.7
Syphilis (miscellaneous).....	25	18	72.0
Syphilis (central nervous system)			
Latent.....	44	35	79.5
Dementia paralytica.....	32	23	71.9
Tabes (dementia paralytica).....	30	24	80.0
Tabes.....	31	26	83.9
Infections (miscellaneous).....	33	20	60.6
Total.....	321	227	70.7

Influence of Age and Sex.—Age and sex were not significant as factors in the incidence of herpes.

Influence of Disease.—The specific disease for which the patient received fever therapy had no marked influence on the incidence of herpes. However, in patients with syphilis of the central nervous system the incidence was greater than in those with other diseases (table 2).

Influence of Degree of Temperature.—The relation of the incidence of herpes to the different temperatures during the initial treatment is shown in table 3. It may be noted that the higher the temperature of the initial treatment the more frequent was the occurrence of herpes.

Influence of Previous Susceptibility.—A history of previous susceptibility to herpes was obtained from 131 patients (table 4). Susceptibility has been classified as follows: definite, once a year or oftener; slight, occasional attacks at no definite time interval; none, when the patient had no knowledge of ever having had herpes. Herpes more often followed fever therapy when the patient had had many previous attacks.

Influence of a Single Vaccination.—The routine vaccination against smallpox of 100 patients at the San Francisco Hospital preceded the course of fever treatments by a few days to a few weeks. The patients treated at the University of California Hospital were

Per cent
of patients

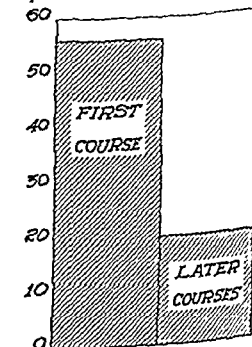


Chart 2.—Incidence of herpes in 39 patients who had two or more courses of treatment.

not vaccinated on admission or at any time during the course of treatment. Over the same period of time, from May 1939 to September 1940, the incidence of herpes in patients at the San Francisco Hospital was 68 per cent and that in the patients at the University of California Hospital was 66.7 per cent.

The relation of the incidence of herpes to the time interval between vaccination and the first fever treatment is shown in table 5. If one assumes that immunity to herpes is developed at the same rate as immunity to smallpox after vaccinia inoculation, then apparently sufficient time had elapsed in many of the cases for the development of protection; nevertheless the incidence of herpes was not decreased.

Regardless of the patient's reaction, a single vaccination had no effect on the incidence of herpes following artificial fever therapy (table 6).

COMMENT

The development of herpes simplex under conditions of artificial fever confers a certain amount of resistance to further attacks in the majority of patients. Although 70 per cent of all patients had herpes, only 29 per cent of those with herpes had recurrent attacks during the first course of fever treatment. In the few patients who received second and third courses, herpes occurred less frequently regardless of the interval between courses. The incidence was 56 per cent during the first course and 20 per cent in the later courses. There are two possible explanations for this decrease: (1) that a certain degree of immunity to herpes was produced by

TABLE 3—Incidence of Herpes as Related to Temperature of the Initial Treatment

Temperature, C	Number of Patients Treated	Number of Patients with Herpes	Percentage of Herpes
39.0-39.5	38	21	55.26
39.6-40.1	107	59	55.14
40.2-40.7	87	53	60.91
40.8-41.0	53	46	86.79

the preceding attacks or (2) that artificial fever no longer was a sufficiently strong stimulus.

Analysis of our data shows that the appearance of herpes is dependent to some extent on individual susceptibility and on intensity of the stimulus. The stimulus, which in this instance is the fever, has a roughly quantitative effect, owing to the fact that the incidence of herpes increases in proportion to the height of the fever.

Irrespective of the patients' reactions, a single smallpox vaccination failed to lessen the incidence of herpes in the 100 patients who are the subjects of this report. This finding indicates that under these circumstances a single smallpox vaccination does not increase materially the resistance to herpes. The reports that vaccine virus and herpes virus are related from an immunologic point of view have not been confirmed.

The use of smallpox vaccination for the prevention of recurring herpes is based on reported clinical success. These reports should be accepted with reservation until further investigation has been made. We appreciate that sweeping conclusions in regard to this point cannot be drawn from the data presented here. Although our patients were vaccinated only once, it is fair to assume that if this procedure had increased immunity to herpes virus it would have paralleled the immunity to smallpox. Smallpox immunity follows vaccination rapidly and as a rule is developed to a high degree after a single vaccination. A second consideration is that these patients were subjected to a very high temperature, which undoubtedly is an unusually

intense activator. Possibly the smallpox vaccination conferred some degree of immunity to herpes, which was, however, not sufficient to prevent the clinical appearance of herpes when the patient was subjected to the stimulus of artificial fever.

TABLE 4—Incidence of Herpes as Related to Previous Susceptibility

Tendency to Herpes	Number of Patients Treated	Number of Patients with Herpes	Percentage of Herpes
Definite	24	23	95.8
Slight	55	42	76.4
None	52	25	48.1
Total	131	90	68.7

SUMMARY AND CONCLUSIONS

1. Herpes simplex following artificial fever therapy occurred in 227 of 321 patients, or 70.7 per cent.

2. An analysis shows that in 80 per cent of the 227 patients herpes developed after the first treatment, in 13.7 per cent after the second, and in 2.6 per cent after the third. The occurrence of herpes was negligible or absent thereafter.

3. In 29.1 per cent of the patients with herpes the condition recurred during the same series of treatments. Recurrences were noted in 22.1 per cent of those who had been vaccinated and in 32 per cent of those who had not been vaccinated.

4. In the 39 patients who received more than one course of artificial fever therapy, herpes was twice as common during the first series as during subsequent series.

5. Sex and age were not important factors in the production of herpes.

6. The incidence of herpes was definitely higher in the patients with syphilis of the central nervous system than in those with gonococcal infection.

TABLE 5—Time Interval Between Vaccination and the First Fever Treatment

Time in Days	Number of Patients Treated	Number of Patients with Herpes	Percentage of Herpes
1-11	62	39	62.9
12-27	21	17	80.9
Over 28	15	11	73.3

TABLE 6—Effect of Response to Smallpox Vaccination on Incidence of Herpes

Reaction	Number of Patients Treated	Number of Patients with Herpes	Percentage of Herpes
Primary take	45	32	71.1
Immune reaction	22	14	63.6
No reaction	23	22	95.7

7. Initial high temperatures, i. e. from 40 to 41 C. (104 to 105.8 F.) were more often followed by herpes than were lower temperatures, i. e. from 39 to 40 C. (102.2 to 104 F.).

8. Patients with a known tendency toward herpes prior to the artificial fever therapy were more likely

to be affected following fever therapy than those without such a tendency.

9. A single smallpox vaccination did not lessen the incidence of herpes in 100 patients vaccinated prior to artificial fever therapy, irrespective of their reaction to the vaccinia inoculation.

ABSTRACT OF DISCUSSION

DR. MARION B. SULZBERGER, New York: The study is designed to answer a definite, as yet unanswered, question; the experiments are adequate and the conclusions seem to be justified by the results of the experiments. Herpes simplex presents some of the most fascinating problems. This disease in particular brings to light clearly at least two important basic phenomena of the mechanisms at play in the production of disease in general. The first one is what I like to call the synergistic effect. For example, I have seen herpes simplex which appeared when pneumonia affected the patient or at the onset of spinal meningitis or any sharp rise in temperature, or on exposure to sunlight, on exposure to other elements such as cold or wind, at the time of menses, with each extramarital intercourse or after the ingestion of specific foods (in 2 of my cases I could repeatedly produce herpes: in 1 of these by feeding caviar and in another case by giving chocolate; and in a third case I believe the eating of certain nuts brought on the attack); and I have seen other attacks of herpes appear regularly after the ingestion of certain drugs such as acetylsalicylic acid or bromides. Now in all these cases, regardless of their immediate trigger mechanism, the virus is in the blister; and we might therefore well say that the virus was the cause of the disease. But one can't speak any longer of the cause of a disease—because what caused the disease here was not alone the presence or the action of the virus. In view of these facts we must conclude that the herpes simplex virus is always present and that what caused the disease was a reduction in the local resistance to that virus, a reduction caused by different factors in different cases. So the disease is produced in a synergistic manner by the virus plus some other factors which upset the local tissue resistance to its pathogenic activity. If one would conclude that the virus alone was sufficient to cause the disease, one would say "Well, with this virus we must be able to produce herpes simplex." However, if you take herpes simplex virus and inoculate it into 100 individuals intracutaneously you don't get over 70 to 80 per cent of takes. Certainly in many reported series the takes have been as low as 30 per cent. But, as has just been shown, if you give 100 individuals artificial fever you produce the disease in 70, 80 or more per cent according to the height of the fever that you produce. So it is at least as justifiable to say that fever causes herpes simplex as it is to say that the virus causes herpes simplex and neither of these statements is entirely true. The causal mechanism of herpes simplex is the combination of certain immunologic changes produced by fever or by many other agencies plus the presence of the virus.

DR. ARTHUR G. SCHOCH, Dallas, Texas: I also am enthusiastic about these results. I inquired from the department of fever therapy in Dallas about what percentage of herpes was obtained and Dr. Metz got the figures for me. It was 36 per cent in a series of 62 patients, about half of what has been presented. It is rather logical, I think, that one single vaccination should not protect a large majority of these persons, because the time element is a factor if vaccination does confer any immunity. Here we are led to believe it does not. A certain amount of time must elapse for that immunity to be built up to a sufficient level to offer some protection. There is a natural susceptibility and a natural immunity to recurrent herpes simplex. My experience with the use of vaccination has been that, in certain individuals if vaccinated repeatedly, and preferably at several sites on each occasion, it does protect against the recurrent attacks of herpes simplex. It has protected for at least a year in 62 per cent of the individuals whom we vaccinated. They were being vaccinated six or seven times. Recently we have vaccinated the approximate site of the recurrent herpes, particularly when it was on the trunk or arm. The

most striking thing about this study to me has been that out of a large group of herpes simplex patients not 1 had herpes simplex lesions below the collar line. That is in direct opposition to what I think we all see in office practice. Large numbers of individuals have recurrent herpes simplex over the sacral region, the buttocks, the posterior thigh and the arms. Every one of the patients in this series had herpes simplex on or about the face.

DR. ROY KILE, Cincinnati: I agree that smallpox vaccination does not help in the treatment of herpes simplex. Some three or four years ago I tried taking the fluid from the herpes simplex blister and inoculating it somewhere else on the body to see if it would not build up an immunity against the virus in some way. Dr. Floyd Markham also took this fluid and grew it on the chick embryo and with both strains—the strain that produced encephalitis in a rabbit as well as that which just produced a keratitis—built up the resistance by injecting this intradermally. I believe that it has helped 10 persons whom I observed over a period of several years. I am going on the patient's opinions. They believe it has reduced the frequency and severity of the herpes attacks. This method of attack needs further study. There is one interesting complication: One man whom I inoculated on the forearm had had repeated attacks of herpes simplex on the same area on the buttocks. He told me a year later that each time at which it recurred on his buttocks he also got a vesicle at the site where I inoculated him. Perhaps I had fixed the virus in these cells. That is a complication one must be careful of. Incidentally, the inoculation of the rabbit's eye is a simple procedure and may be of diagnostic value at times for genital lesions. It is easy to produce a keratitis with herpes simplex virus. It is typical and may be of value in differentiating other lesions of this area from herpes simplex.

DR. EVERETT SEALE, Houston, Texas: My clinical results have more or less paralleled those of Dr. Schoch and I have felt enthusiastic about the benefit patients have derived from the use of smallpox vaccine for recurrent herpes. I have now followed more than 20 cases over an adequate period of time and of this group 80 per cent have had satisfactory results. It would seem to me that the lack of results the author has obtained can be explained either by the overwhelming dose of the precipitating factor, in this instance fever, in contrast to the mild fever that is experienced in clinical trial and the short lapse of time between vaccination and fever.

DR. NORMAN N. EPSTEIN, San Francisco: With regard to the incidence of herpes simplex following artificial fever, it is our feeling that herpes simplex can be produced in practically every one if a sufficient height of temperature is induced. Most reports correspond closely to our figures; that is, 70 per cent. In those patients who received initial temperatures of 106 F. the percentage of herpes increased to 85. Whether the time element of vaccination is the explanation, why a single smallpox vaccination did not protect this group against herpes I do not know; however, I do not think so, because some of these patients had been vaccinated from two to six weeks previous to the time of their fever therapy. We know that there are instances of patients having been protected against smallpox by being vaccinated shortly after exposure to smallpox. It seems that if one single smallpox vaccination protects a large part of the population against smallpox why shouldn't it protect them against herpes if these two viruses are closely related? From an experimental point of view there appears to be no relation between these two viruses. They are entirely distinct, and the original work on which this relationship is based has not been confirmed. I am grateful to Dr. Sulzberger for elaborating on the purposes of this study. We were not particularly interested in the benign lesion of herpes as such but in what this study might contribute to our general knowledge of virus infections. It is our hope that studies of herpes simplex where the virus is readily available and can be easily studied might contribute something to this important field. Artificial fever, being a procedure in which herpes can be almost regularly produced, may be employed to test out other methods of prevention of herpes simplex, such as Dr. Kile mentioned, the use of the roentgen ray, the use of ascorbic acid and perhaps other methods.

THE CHEMOTHERAPY OF INTESTINAL
PARASITESERNEST CARROLL FAUST, PH.D.
NEW ORLEANS

In order that this discussion may be limited to the field in which I am primarily concerned and in which I have had some degree of experience, consideration will be directed to the groups of animal parasites referred to as the protozoa and the helminths. Some of the drugs available for treating animal parasites, particularly certain anthelmintics, are a heritage from the ancients of the Old World and from the Amerinds;¹ others, particularly certain antiprotozoan drugs, are of recent origin or recent application to parasitoses of the human body. For the most part, use of the former group is based primarily on clinical experience without antecedent pharmacologic assay, while clinical use of most of the latter group has been a sequel to adequate tests in the laboratory.

It is almost axiomatic to state that a suitable chemotherapeutic is one which is as nearly specific as possible within the limits of dosage tolerance of the average patient. When this concept is directed to the field of animal parasites, it must be admitted that with possibly one exception (i. e., atabrine in giardiasis) no present day drug is eminently efficient and none is useful against both protozoa and helminths.

ANTIPROTOZOAN CHEMOTHERAPY

Of the numerous protozoan infections of the human bowel, only two are sufficiently important to warrant discussion here. These are amebiasis, caused by the pathogenic ameba, *Endamoeba histolytica*, and giardiasis, produced by the flagellate *Giardia lamblia*.

Amebiasis, whether in an acute, subacute, chronic or carrier state, whether manifesting symptoms of fulminating dysentery, subacute appendicitis, gallbladder disease, peptic ulcer or essentially asymptomatic in character, should be treated until the patient is definitely freed of the causative organisms. A good amebicide must attack the active trophozoite in the bowel wall. To this extent it must be absorbed from the lumen of the large bowel. The days of ipecac are fortunately past and the advocates of bismuth are less vocal today than they were two decades ago. Emetine has its place in the treatment of acute amebiasis,² but in most patients it only ameliorates symptoms and prepares the way for one or more courses of treatment with the iodo or arsenical preparations.

Chiniofon is the iodo compound which has had longest clinical test and which probably deserves first consideration today.³ It is essentially nontoxic unless the watery diarrhea which accompanies its use in some patients is regarded as a toxic manifestation. I prefer to regard a moderate hyperperistalsis with diarrhea as a distinct aid in washing amebas out of little lacunae in the bowel wall and thus in hastening the action of chiniofon. Diodoquin, with a higher iodine content

than chiniofon but stated to have little absorption from the surface of the bowel wall, is a much more recent preparation, has been reported on favorably by a few workers,⁴ and may have a rightful place in the armamentarium against amebiasis, especially in a prophylactic way.⁵ It produces little or no diarrhea, and no toxic effects have been reported. However, one must not resort to wishful thinking: controlled clinical tests with this preparation are still too few to justify undue optimism. Vioform,⁶ with an iodine content between chiniofon and diodoquin, has been found to have amebicidal value but has not had sustained supporters. The newest iodine preparation, enterovioform⁷ (iodo-chloroxyquinolin), is stated to be quite specific but has had very limited trial.

The first of the arsenicals to gain considerable favor as an antiamebic drug was acetarsone. It is usually efficient but is poorly tolerated. Even in patients not sensitive to arsenic it frequently produces distressing abdominal pain and cramps. Internists, therefore, welcomed the advent of carbarsone, especially after clinical trial⁸ suggested its relative specificity. Longer and more extensive use has found it to be satisfactory in the hands of some physicians, especially for asymptomatic cases, but its limitations are becoming increasingly recognized. Hoechst 5547, stated to contain 16⅓ per cent of arsenic and 33⅓ per cent of bismuth, is a recent addition to the arsenical preparations used in amebiasis,⁹ but sufficient experience has not been accumulated to warrant any conclusive evaluation of this drug.

In summary, while there are several moderately satisfactory antiamebic drugs available, not one has proved to be entirely efficient in all cases of amebiasis. Chiniofon is my own preference, based on nearly twenty years' comparison of this drug with many other preparations, including alcresta tablets of ipecac, emetine hydrochloride, emetine bismuth iodine, acetarsone and carbarsone. However, if chiniofon is not curative after two full courses of treatment, diodoquin may safely be tried. If this also fails, carbarsone therapy may be justifiably instituted, provided the patient does not have a known arsenical idiosyncrasy.

Giardiasis is a relatively common infection of childhood and is especially prevalent in institutionalized homes in the Southern United States. From two thirds to three fourths of the patients are spontaneously freed of the organism during adolescence, while the remaining infections tend to persist. *Giardia* parasitizes the cuticular surface of the mucosa at the level of the duodenum and upper half of the jejunum. It is probably capable of entering the common bile duct and becoming an inhabitant of the lumen of the gallbladder. It is not known to invade the intestinal mucosa but in myriad numbers may conceivably cause sufficient irritation of the surface of the duodenum to produce a chronic catarrhal condition, with colicky pains in the duodenum and a loose, mucous diarrhea. Until recently no satisfactory treatment has been available, but since 1937 there has

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Read in the Panel Discussion on Drug Therapy in the Alimentary Tract before the Section on Gastro-Enterology and Proctology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1. Faust, E. C.: Human Helminthology, Philadelphia, Lea & Febiger, 1939, p. 648.

2. Craig, C. F., and Faust, E. C.: Clinical Parasitology, Philadelphia, Lea & Febiger, 1940, p. 68.

3. Craig, C. F., in Reimann, H. A.: Treatment in General Medicine, Philadelphia, F. A. Davis Company, 1939, vol. 1, chapter 1, p. 222.

4. Hummel, H. G.: South. M. J. 30: 202, 1937; Am. J. Digest. Dis. 6: 27, 1940. Silverman, D. N.: Am. J. Digest. Dis. 4: 281, 1937. Jadin, J.: Ann. Soc. belge de méd. trop. 20: 75, 1940.

5. Craig, C. F.: Am. J. Trop. Med. 20: 799, 1940.

6. David, N. A.; Johnstone, H. G.; Reed, A. C., and Leake, C. D.: Treatment of Amebiasis with Iodochlorhydroxyquinoline (Vioform N. N. R.), J. A. M. A. 100: 1658 (May 27) 1933.

7. Mayer, M.: Indian M. Gaz. 75: 262, 1940.

8. Reed, A. C.; Anderson, H. H.; David, N. A., and Leake, C. D.: Carbarsone in Treatment of Amebiasis, J. A. M. A. 98: 189 (Jan. 10) 1932.

9. Castex, M. R., and di Cio, A. V.: Prensa med. argent. 22: 1041, 1939.

been an increasing literature¹⁰ on the high efficiency of atabrine in the elimination of Giardiasis. The drug is administered as in malaria, 0.1 Gm. (1½ grains) three times daily before meals for five days, with reduced dosage for children. While other acridine preparations, including acranil¹¹ have more recently been advocated and are reported to have specific action, it may be stated that atabrine constitutes at least one efficient giardicidal drug.

ANTHELMINTIC THERAPY

The following helminthic infections of the intestine require consideration because of their clinical significance in the United States: oxyuriasis, caused by the pinworm or seatworm (*Enterobius vermicularis*); strongyloidiasis, due to *Strongyloides stercoralis*; whipworm infection, due to *Trichocephalus trichiurus* (or *Trichuris trichiura*); ascariasis, resulting from infection with *Ascaris lumbricoides*; hookworm infection, and the tapeworm infections, caused by *Taenia saginata*, *Taenia solium*, *Hymenolepis nana*, *Hymenolepis diminuta* and *Diphyllobothrium latum*.

There is no single eminently satisfactory anthelmintic. Smillie¹² has stated that "we have been looking for an ideal vermifuge for a long time, but it has never been discovered." Coupled with only relative efficiency is the demonstrable fact that no good anthelmintic, with the possible exception of hexylresorcinol crystoids, may be safely administered to a patient without adequate supervision by the physician, including pretreatment and post-treatment care.

In oxyuriasis, the NIH cellophane anal swab¹³ has provided an accurate diagnosis and an adequate post-treatment index of the efficiency of the anthelmintic used.¹⁴ Both before and after the introduction of this diagnostic technic the oral administration of tetrachlorethylene,¹⁵ carbon tetrachloride¹⁶ and hexylresorcinol crystoids,¹⁷ as well as enemas and suppositories of various types,¹⁸ all fell far short of desired results in eradicating pinworms. On the other hand, gentian violet medicinal has proved to be approximately 90 per cent efficient in producing cures,¹⁹ provided all infected individuals in the infected family or institution are treated at the same time. The four and one half hour Seal-Ins or Enseals tablets of gentian violet have an apparent superiority over those with ordinary enteric coating,²⁰ since they release the drug at the specified time in the bowel, irrespective of the *pH*. Possibly the most satisfactory single course of treatment is as follows: Two one-half grain (0.03 Gm.) tablets three times daily, immediately before or with meals, for eight days; rest one week, then repeat the treatment. This affords adequate time to kill young worms which have hatched from viable eggs introduced into the mouth

from a contaminated environment and swallowed during the first week or ten days of treatment.

For strongyloidiasis the only demonstrated specific is also gentian violet. I²¹ introduced this therapy into the United States in 1930 following favorable trial in Java. While the old enteric coated tablets produced a relatively high percentage of cures, a few cases refractory to repeated courses of treatment were soon found. It was discovered experimentally in the dog that in such failures some of the parasitic female worms were embedded deeply in the mucosa of the duodenum and jejunum²² or even in the pyloric mucosa and were not reached by the dye in lethal concentration. For these refractory cases I²² advocated transduodenal intubation of 25 to 50 cc. of a 1 per cent solution of gentian violet medicinal. Trial produced complete success in most cases which had previously been refractory. More recently, with the introduction of Seal-Ins and Enseals coating, a one and one-half hour coating has been prepared. Preliminary tests on several patients, including 1 who had resisted all previous methods of treatment, have been entirely successful. The usual course of treatment consists of two one-half grain one and one-half hour coating Seal-Ins or Enseals tablets of gentian violet three times daily with meals, until 50 grains (3.25 Gm.) has been taken. Follow-up stool examinations by concentration technics must be employed for three to six months to provide relative certainty that a cure has been effected.

During the centuries the anthelmintics recommended for ascariasis have been legion. Of these the most conspicuous have been Oriental wormseed, with its refined product santonin,¹ and the related American wormseed, from which oil of chenopodium¹ was obtained. Since ascariasis is primarily a disease of childhood, especially in environments where infected small children defecate in and immediately around the house, it is essential to have an anthelmintic which is unquestionably safe. While santonin is relatively safe, its efficiency is low; on the other hand, although oil of chenopodium is highly efficient, it is a dangerous preparation when given in full therapeutic doses. A much more satisfactory product developed within recent years is caprokol (hexylresorcinol crystoids)²³ in hard (i. e., internally shellacked) gelatin capsules, available in 0.2 and 0.5 Gm. sizes. When this preparation is taken on an empty stomach without chewing and food is withheld for four to five hours, the drug is both nontoxic and highly efficient. (Dosage: 0.4-0.6 Gm. for small children; 0.8-1.0 Gm. for older children and adults.) However, to insure against absorption of the disintegrating by-products of the worms, to which patients are frequently sensitive, post-treatment saline purgation is recommended. Not only are carbon tetrachloride and tetrachlorethylene nonspecific for *Ascaris*, but in the presence of *Ascaris* both are contraindicated unless preceded or accompanied by an ascaricidal preparation. It is important to remember that viable *Ascaris* eggs seeded on the soil remain infective for months and possibly years after they have been sown. This explains the frequent reinfection of many children in *Ascaris* environments even with repeated specific treatment.

In the United States today hookworm infection is for the most part confined to the rural South, most commonly in isolated "poor white" families who have no

10. Galli-Valerio, B.: Schweiz. med. Wchnschr. 67: 1181, 1937.
Bacigalupo, J.: Arch. argent. de enferm. d. ap. digest. y de la nutrición 13: 5, 1937.
Brumpt, L.: Compt. rend. Soc. de biol. 124: 1040, 1937.
Love, J., and Tayloe, G. B.: U. S. Nav. M. Bull. 38: 239, 1940.
Hall, A. A.: Ohio State M. J. 36: 514, 1940.
11. de Muro, P.: Acta med. Scandinav. 102: 17, 1939.
Friedrich, L.: Gastroenterologia 65: 24, 1940.
12. Smillie, W. G., in discussion on Conferences on Therapy: The Use of Anthelmintics, J. A. M. A. 113: 410 (July 29) 1939.
13. Hall, M. C.: Am. J. Trop. Med. 17: 445 (May) 1937.
14. Sawitz, W.; Odum, V., and Lincicome, D. R.: Pub. Health Rep. 54: 1148, 1939.
15. Wright, W. H.; Bozicevich, John, and Gordon, L. S.: Studies on Oxyuriasis: Therapy with Single Doses of Tetrachlorethylene, J. A. M. A. 109: 570 (Aug. 21) 1937.
16. Docherty, J. F., and Burgess, E.: Brit. M. J. 2: 907, 1922.
17. Brown, H. W.: Proc. Soc. Exper. Biol. & Med. 30: 221, 1932.
18. Wright, W. H., and Cram, E. B.: Studies on Oxyuriasis: Some Aspects of Problem of Therapy, Am. J. Dis. Child. 54: 1276 (Dec.) 1937.
19. Wright, W. H.; Brady, F. J., and Bozicevich, John: Proc. Helminthol. Soc. Washington 5: 5, 1938.
D'Antoni and Sawitz.²⁰
20. D'Antoni, J. S., and Sawitz, W.: Am. J. Trop. Med. 20: 377, 1940.

21. Faust, E. C.: Internat. M. Digest 17: 57, 1930.

22. Faust, E. C.: Rev. Gastroenterol. 5: 154, 1938.

23. Faust, E. C.; Dwyer, H. L., and Casparis, H.: J. Pediat. 10: 542, 1937.

privies. Rarely does one see severe hookworm disease today in the Southern United States as it existed a quarter century ago. The most specific drugs used against hookworms are thymol, oil of chenopodium, carbon tetrachloride, tetrachlorethylene and caprokol. Thymol is neither eminently efficient nor nontoxic. Oil of chenopodium and carbon tetrachloride are both very efficient and very toxic. Tetrachlorethylene is nearly as efficient as carbon tetrachloride and is practically nontoxic in the absence of alcohol and absorbable oil, since it is hardly soluble in water.¹ Thus, it is usually the drug of choice in hookworm infection. Caprokol²³ probably ranks with thymol in its hookworm removal capacity but is much safer for administration to small children, the debilitated and persons with frank malnutrition and anemia. It has a minimum 75 per cent hookworm removal rating. If it is administered two or three times within a week to ten days, the worm burden is usually reduced far below the threshold of clinical importance. Moreover, when ascariasis complicates hookworm infection, caprokol is unquestionably the safest efficient drug, although a combination of tetrachlorethylene and oil of chenopodium is possibly more nearly curative for single administration.²⁴

Supportive treatment, as iron or blood transfusions and a nutritious diet, should precede and accompany specific medication in severe hookworm infection.

Trichocephaliasis (trichuriasis, whipworm infection) is relatively common in the rural and suburban population of the Southern United States, although most patients harbor a small number of worms and manifest low grade, usually neurotoxic, symptoms. Occasionally, massive infection produces a clinical picture suggestive of advanced hookworm disease.

There is today in the United States no effective anthelmintic against whipworms. In tropical America the fresh crude latex of the bastard fig trees *Ficus glabrata* and *F. doliaria*, the so-called *leche de higuerón*, is taken periodically in 1 to 2 ounce (0 to 60 cc.) doses to free the bowel of whipworms.²⁵ Semirefined products of this latex, containing the proteolytic enzyme ficin, have recently been tested experimentally by me for parasitocidal value and have in one way or another failed to meet the combined requirements of efficiency and safety which the fresh crude latex possesses.²⁶

Should an American physician have a case of whipworm infection manifesting symptoms, the following treatment is suggested: After the evacuation of feces from the bowel by saline purgation and high tepid water enemas, to expose the whipworms in the cecum and appendix directly to the anthelmintic tetrachlorethylene may be given in full therapeutic doses as recommended for hookworm infection. If this procedure is repeated several times at weekly intervals, it should remove practically all of the worms except a few remaining attached to the distalmost portion of the appendiceal wall.

Iron therapy in whipworm infection has proved to be useless.²⁷

For tapeworm infections the Egyptians used decoctions of pomegranate bark (containing pelletierin)¹ and the Greeks depended primarily on decoctions and extracts of fern root (containing filicin).¹ These two anthelmintic principles are today widely used in tape-

worm therapy and have only one important competitor; namely, carbon tetrachloride. All these products are relatively potent and all are at times highly toxic. The most popular American preparation is oleoresin of aspidium, which provides about a 90 per cent cure rate when fresh and administered under proper management. The patient should have a light diet for at least two days before specific treatment, should have the bowel thoroughly cleansed by saline purgation the night before, should omit breakfast and should remain in bed on the morning of treatment. The standard technic of administering the drug in three divided doses of 20 minims (1.25 cc.) each at one-half hour intervals, followed two hours later by saline purgation, is probably less effective than transduodenal intubation²⁸ of a suspension of the drug (4 cc.) in mucilage of acacia (30 cc.) and saturated solution of sodium sulfate (30 cc.). Moreover, recent clinical tests of oral administration of this suspension have proved to be most satisfactory in the hands of my colleague Dr. J. S. D'Antoni.

Carbon tetrachloride may be used for evacuating tapeworms in case oleoresin of aspidium has repeatedly failed.²⁹ There is this important difference in the appearance of the evacuated worm following administration of the two therapeutics: after oleoresin of aspidium the scolex, if passed, is invariably intact and readily recognizable; after carbon tetrachloride the scolex and most of the proglottids are already digested and frequently undiagnosable.

In children harboring the dwarf tapeworm (*Hymenolepis nana*) caprokol, as prescribed for ascariasis, has at times been helpful,³⁰ while the administration of gentian violet tablets, 1 grain (0.065 Gm.) three times daily for a period of a week or more has been found moderately effective.³¹

In the treatment of tapeworm infections it is important to remember that cure is not effected if the scolex is not evacuated, that preparation of the patient is as important as specific medication and that undue hyperperistalsis of the bowel may be as much of a hindrance to eradication of the worm as a hypotonic bowel.

COMMENT

In both the protozoan and helminthic infections herein presented the numerous subjective factors which enter into the patient's condition constitute an integral part of each picture of infection. The general nutrition of the patient, his tolerance or intolerance of the parasite locally in the bowel and its by-products in his system, together with his known or potential idiosyncrasies to special drugs must all be evaluated. In the helminthiasis the preparation of the patient for specific therapy and post-treatment care constitute almost as important a step in therapeutics as administration of the specific drug, for such care prepares the way for optimum action of the drug and guards the patient against unnecessary toxic damage from absorption of the drug or products of disintegration of dead or dying worms.

In this connection brief comment may be made of the actual or potential therapeutic aid which may be rendered in animal parasite infections of the bowel by the administration of sulfinilamide, azosulfamide, sulfathiazole and sulfaguanidine. As far as can be ascer-

24. Maplestone, P. A., and Mukerji, A. K.: *Indian M. Gaz.* 75: 193, 1940.

25. Thomen, L. F.: *Am. J. Trop. Med.* 19: 409, 1939.

26. Faust, E. C.: *Proc. Soc. Exper. Biol. & Med.*, to be published.

27. Maplestone, P. A., and Mukerji, A. K.: *Indian M. Gaz.* 74: 607, 1939.

28. Gunn, H.: *Am. J. Trop. Med.* 11: 273, 1931. Gelch, M.: *J. Lab. & Clin. Med.* 20: 841, 1935.

29. Sandebrand, J. H.: *New England J. Med.* 218: 292, 1938.

30. Faust, E. C., and Caparis, R.: *Sandebrand*, 1938.

31. Maplestone, P. A., and Mukerji, A. K.: *Indian M. Gaz.* 74: 195, 1939.

tained, not one of these preparations has any specific action against intestinal protozoa or helminths. However, there is suggestive clinical evidence that in case there is secondary bacterial invasion of the bowel wall in areas where amebic ulceration has occurred, or in the vicinity of old hookworm lesions, the use of sulfonamide derivatives tends to disinfect these sites and thus to cause earlier healing than would the specific antiparasitic drug alone.

Thus the physician's task in eradicating intestinal parasites is not confined to the administration of the drug of choice for each infection. Assuming that an accurate diagnosis has been made and the appropriate drug has been selected, the patient must be prepared for the treatment in the same sense he is prepared for important surgical procedures, namely by building up his resistance and reducing the likelihood of excessive shock. If the infection is multiple and requires several antiparasitic drugs, these must be prescribed in an orderly sequence, eliminating first the parasite of major clinical importance and reserving for the last the ones of minor significance or those least likely to be removed by available drugs. The bowel must be freed of masses of feces, and the heads of worms attached to the bowel wall must be freed from mucus to expose the parasites to maximum tolerated doses of the drug. Moderate peristaltic activity is desired, but undue hyperperistalsis is to be avoided.

There should be available a fresh stock of the most efficient drug for treating each infection and at least one satisfactory substitute. In one large hospital in the South the staff in one important service has had in its own pharmacy list only two anthelmintics, *santonin* and *caprokol*, both anti-*Ascaris* drugs, which have little if any effective action on whipworms, *Strongyloides* or the larger tapeworms. Physicians in increasing numbers are coming to evaluate both the relative efficiency and the toxicity of the many antiparasitic drugs. The recent ruling of the U. S. Food and Drug Administration that directs pharmacists not to dispense most anthelmintics without a physician's prescription is a step safeguarding both the patient and the physician.

Finally, success in eradicating a parasitic infection in a particular patient and in bringing him back to health does not relieve the physician of his responsibility. As long as the patient is ignorant of the source of his infection and is therefore liable to reinfection again and again from the same source, he is not permanently cured. Possibly many physicians might profit from a more accurate knowledge of the epidemiology as well as *therapeusis* of parasitic infections.

SUMMARY

1. A suitable therapeutic regimen for protozoan infections of the alimentary tract due to *Endamoeba histolytica* and *Giardia lamblia* and of helminthiasis due to *Enterobius vermicularis*, *Strongyloides stercoralis*, the human whipworm (*Trichocephalus trichiurus*), *Ascaris lumbricoides*, the hookworm (*Necator americanus*) and human tapeworms is one which is as nearly specific as possible within the limits of dosage tolerance of the average patient.

2. All cases of amebiasis, including the asymptomatic group, should receive treatment until cured. While emetine is frequently indicated in acute amebiasis to control symptoms, it must not be regarded as curative. Dependence must usually be placed on iodo or arsenical compounds. *Chiniofon* (iodoxyquinoline sulfonic acid) is probably the drug of choice and has no essential

contraindication. Because of its higher iodine content, *diodoquin* deserves trial if *chinofon* fails. *Enterovioform* has not had adequate clinical use to justify accurate evaluation. *Carbarson* is the only arsenical compound which merits consideration as a routine substitute for or supplement to *chinofon* in treating amebiasis. None of these drugs can be depended on to eradicate amebiasis in every patient.

3. *Atabrine* is apparently specific for giardiasis. Other acridine compounds may eventually be found to be equally satisfactory.

4. *Gentian violet* medicinal is the most satisfactory drug for oxyuriasis and for strongyloidiasis. The most efficient preparation is the *Seal-Ins* or *Enseals* coating. For the former infection the four and one-half coating is recommended, for the latter, the one and one-half hour coating. The total adult dosage for both infections is 50 grains, given in 1 grain amounts three times daily with meals. In strongyloidiasis the drug is prescribed continuously until the total amount has been taken; in oxyuriasis it is given for eight days, followed by one week's rest and then repeated for eight days. For efficiency all cases of oxyuriasis in the home or institution should be treated simultaneously. The NIH cellophane anal swab is recommended as particularly helpful in recovering *Enterobius* eggs.

5. *Caprokol* (hexylresorcinol crysoids) in hard gelatin capsules (single dose, 0.6-1.0 Gm.) is the preparation of choice in ascariasis. It is essentially nontoxic, much more efficient than *santonin* and distinctly safer than oil of *chenopodium*. Pretreatment and post-treatment saline purgation is advised.

6. The routine drug of choice for hookworm infection is tetrachlorethylene, because of its low toxicity and relatively high efficiency. It should be preceded and followed by saline purgation. *Caprokol* is relatively satisfactory, may be repeated without harm and is especially recommended for small children, the aged and the debilitated. In combined ascariasis and hookworm infection *caprokol* is the drug of choice, although combined tetrachlorethylene and oil of *chenopodium* are moderately safe and highly efficient in eradicating both species of worms. Supportive treatment with iron or blood transfusions and a nutritious diet should precede and accompany specific medication.

7. There is no specific drug available in the United States for whipworm infection. In Tropical America the fresh crude latex, *leche de higuerón*, is commonly used with success. This product ferments rapidly, and semirefined fractions tested experimentally fail to meet the requirements of combined safety and efficiency. Repeated administrations of tetrachlorethylene following saline purgation and enemas will probably remove most of the whipworms.

8. *Oleoresin* of *aspidium* is the usual drug chosen by American physicians for removing tapeworms. The routine administration of a total of 60 minims (4 cc.) in three divided doses a half hour apart, preceded and followed by saline purgation, is probably less efficient than transduodenal intubation of the drug in a vehicle of 30 cc. mucilage of acacia and 30 cc. saturated solution of sodium sulfate. Carbon tetrachloride is a satisfactory substitute for the *oleoresin*.

9. Sulfonamide derivatives are not known to be specific in animal parasitoses of the alimentary tract; nevertheless they may be valuable adjuvants in eliminating secondary bacterial invaders and thus in aiding the repair of lesions of the bowel wall.

10. In addition to accurate diagnosis and the choice of a satisfactory antiparasitic drug, care of the patient before, during and subsequent to specific therapy is essential. Moreover, specific therapeutics for the individual patient is frequently inadequate per se to prevent reinfection. An accurate knowledge of the sources of infection is required in order to bring these infections under control.

THE HARMFUL EFFECTS OF MINERAL OIL (LIQUID PETROLATUM) PURGATIVES

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SAN FRANCISCO

There is perhaps no purgative with which the gastroenterologist is more familiar than liquid petrolatum. This familiarity results in thoughtlessness in its use. Our study of the deleterious effects of this type of drug makes us wonder whether or not the almost routine prescribing of liquid petrolatum has not bred through thoughtlessness and ignorance a serious disregard for the patient's welfare.

The wide use of liquid petrolatum seems to be based on empirical considerations which make little sense when examined critically. Its chemistry is to say the least uncertain and its pharmacologic action a matter of dispute. Some contend that it acts by mechanically softening the feces¹; others hold that it undergoes emulsification² and still others assert that it speeds up peristalsis by its irritative action on the mucous membrane.³ On the other hand, mechanistic conditioning in a machine age has produced the current concept by analogy of an intestinal lubricant.⁴ However, there are further considerations of a physiologic and pathologic nature which merit attention.

The rectum is not a reservoir. Functionally it is but a short passage to the exterior. The true reservoir is formed by the sigmoid and the descending and transverse colon; feces may remain in this portion of the bowel for some time without ill effect. Once the feces enter the rectum, they should be evacuated with the establishment of the defecation reflex. This initiates a strong peristaltic contraction of the colon; the contraction of its longitudinal fibers and the consequent shortening of the rectum by the levatores ani, combined with the simultaneous onset of peristalsis, accompanied by a coordinate relaxation of the anal sphincters, result in the evacuation of the feces.⁵ Failing this, as Alvarez,⁶ Hurst⁷ and others have pointed out, a person will have pressure, symptoms of headache, furred tongue, foul breath, malaise and mental sluggishness.

The use of liquid petrolatum as a laxative may be severely criticized on the grounds that it interferes with this normal physiologic process. The competence of the

rectosigmoid "valve" is destroyed and as a consequence the reservoir effect of the more proximal bowel is lost.⁸ Continual leakage from above results in the rectum being kept partially full most of the time and causes its conversion into an abnormal receptacle for fecal material. There is not sufficient pressure to initiate the defecation reflex, but there is enough fecal material present to cause symptoms of irritation.

When liquid petrolatum is present in the rectum, complete evacuation is impossible. Whatever the degree of emulsification in the intestine, one always finds a tenacious layer of a dirty mixture of oil and feces covering the rectal mucosa. In those having taken liquid petrolatum, one can nearly always discern the presence of the oil macroscopically, making it impossible to examine the rectal wall properly. This is the fact whether the patient has or has not defecated prior to the examination. Often under these conditions, colon flushings are necessary to accomplish proper visualization.

Many investigations have been made regarding vitamin loss as a result of the ingestion of liquid petrolatum. It can now be safely asserted that liquid petrolatum, because of its preferential solubility, interferes seriously with the utilization of carotene and to a lesser extent with vitamin A concentrate as well as with the fat soluble D. This has been amply demonstrated by animal experiments and also by studies on human subjects.⁹ It makes little difference whether the liquid petrolatum is plain or one of the emulsified types in which the liquid petrolatum content is reduced. Curtis and Horton¹⁰ of Ann Arbor have shown that amounts of liquid petrolatum as small as 15 to 30 cc. would still be able to remove all the carotene from a normal diet if the oil comes in intimate contact with food containing carotene.¹¹

To overcome the serious loss of vitamins, various methods for the administration of liquid petrolatum have been advocated.¹² Some of these are remarkable examples of the rationalizing tenaciousness of the human mind rather than of thoughtful therapy. It has been suggested that the oil be taken between meals; that large amounts of expensive carotene, vitamin A and D be given with the oil; that mixtures of fish liver oil containing from 3,000 to 6,000 units of vitamin A per dose be added so as to avoid such changes in color and taste as would mar the elegance of the preparation if ordinary mixtures were added. The natural solution does not appear to have suggested itself.

Liquid petrolatum, whether or not it is in complete emulsion, hastens the motility of the bowel contents in the small intestine and, as a consequence, digestion is incomplete.¹³

There is clinical evidence that persons who have taken oil over a long period of time suffer from "indigestion." This is perhaps due in large measure to interference with absorption from the small intestine.

Liquid petrolatum interferes with the healing of post-operative wounds in the anorectal region and may induce hemorrhage. Most rectal wounds are best left

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Read in the Panel Discussion on Drug Therapy in the Alimentary Tract before the Section on Gastroenterology and Proctology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1. Clark, A. J.: *Applied Pharmacology*, ed 3, Philadelphia, P. Blakiston's Son & Co., 1929, p. 250.

2. Sollmann, Torald: *A Manual of Pharmacology*, ed 4, Philadelphia, W. B. Saunders Company, 1932.

3. Wood, H. C.: *Therapeutics*, Philadelphia, J. B. Lippincott Company, 1905, p. 674.

4. Schlagintweit, E.: *Arch. f. exper. Path. u. Pharmacol.* **12**: 4: 59, 1927. Loewe, S.: *Klin. Wchnschr.* **8**: 1950 (Oct 15) 1929.

5. Best, C. H., and Taylor, N. B.: *Physiological Basis of Medical Practice*, Baltimore, William Wood & Co., 1937, p. 706.

6. Alvarez, Walter: *The Mechanics of the Digestive Tract*, ed. 2, New York, Paul B. Hoeber, Inc., 1928.

7. Hurst, A. F.: *Constipation and Allied Intestinal Disorders*, London, H. Frowde, 1919.

8. Morgan, J. W.: *Am J Surg* **92**: 360-364 (Nov.) 1938.

9. Till, A. T.: *J State Med* **12**: 363 (June) 1934. Dutcher, R. J.; Harris, P. L.; Hartzler, E. R., and Guernant, N. B.: *J. Nutrition* **8**: 269 (Sept.) 1934. Jackson, R. W.: *J. Nutrition* **7**: 607 and 617 (June) 1934. Rowntree, J. I.: *J. Nutrition* **3**: 345 (Jan.) 1931.

10. Curtis, A. C., and Horton, P. B.: *Am. J. M. Sc.* **200**: 102 (July) 1940.

11. Curtis, A. C., and Kline, E. M.: *Influence of Liquid Petrolatum on Blood Content of Carotene in Human Beings*, *Arch. Int. Med.* **63**: 54 (Jan.) 1939.

12. Andersen, O.: *Hospitaltid (Suppl. Festschr. Binn. Hosp.)* **81**: 29, 1938, abstr. *Nutrition Abstr. & Rev.* **8**: 759 (Jan.) 1939.

13. Laczcz, Z.: *Arch. f. exper. Path. u. Pharmacol.* **112**: 365, 1926.

to heal by granulation; if they are of proper shape and are kept clean, the results will be good. Liquid petrolatum interferes with proper hygiene and thereby causes discomfort. Patients who have had frequent rectal hemorrhages from internal hemorrhoids are sometimes relieved by the taking of liquid petrolatum. The stools are softer and cause less trauma, but oftentimes there is more bleeding than ever.

The use of liquid petrolatum is occasionally an indirect cause of pruritus ani. The definite leakage from the anus in those patients who take oil interferes with proper anal hygiene. The delicate perianal skin needs to be kept clean and dry. Pruritus will often persist in spite of adequate treatment if the patient continues to take liquid petrolatum. Most patients with pruritus have local rectal lesions and, even if these are eradicated, cure will not ensue if the use of oil is continued.

Evidence is accumulating that liquid petrolatum may be absorbed,¹⁴ producing pathologic changes in the liver and other abdominal viscera.¹⁵

I have been impressed by a group of symptoms, or syndrome, which for lack of a better term may be called "mineral oil poisoning." Its cause is the continued oral administration of liquid petrolatum, and its treatment is the discontinuance of the oil along with supportive measures to overcome the distressing and oftentimes severe weakness which accompanies this symptom complex. The most frequent symptoms are anorexia, indigestion, flatulence, fatigue, nervousness, dyschesia and anal leakage. Many have suffered weight loss of from 10 to 60 pounds and, in 1 case, more than 100 pounds. In all these cases a complete medical "work-up" was obtained to exclude organic disease. Most of these patients needed no laxatives at all and most of them showed rapid improvement after discontinuance of the oil.

It is true that liquid petrolatum is a laxative and it usually induces soft or liquid stools, so that patients with rectal disease frequently take regular large doses several times daily. In my experience, this often serves to aggravate the local lesions (1) by making a fecal reservoir of the rectum and (2) by making complete evacuation impossible.

I am making a plea and asking physicians to pay more attention to the possible deleterious effects of liquid petrolatum on patients. I feel that physicians have been too willing to get by by telling their patients to take a few doses of liquid petrolatum with the observation that at least it cannot hurt them. Nearly every one thinks of liquid petrolatum as an intestinal lubricant. The contents of the intestine, except for about the terminal three feet, are liquid and the ability of liquid petrolatum to act as a lubricant for this fluid is more germane to the efforts of Lewis Carroll and his "Alice in Wonderland" than to serious pharmacology. Controlled observation has shown that liquid petrolatum on the average reduces the time of passage of a meal from the pylorus to the cecum by several hours. The reduction in the absorption time factor may help to explain the loss of weight and strength which so often occurs in these patients. It would not be too unfair to say that in some respects liquid petrolatum has earned its niche in the section of toxicology rather than in pharmacology.

The internal administration of liquid petrolatum, either alone or in combination with other substances, may be attended by decided disadvantages. In view of the lightheartedness with which it has been prescribed as a laxative, I feel that this discussion is timely.

384 Post Street.

EFFECT OF DRUGS ON THE ALIMENTARY TRACT

PANEL DISCUSSION AT CLEVELAND SESSION

DR. SARA M. JORDAN, Boston, Chairman: This panel discussion has for its purpose the stimulation of interest in the practical use of drugs in the gastrointestinal tract.

CENTRALLY ACTING DRUGS

A number of questions have been received from the floor. First, is the use of morphine indicated in hemorrhage from gastric and duodenal ulcer?

DR. DONALD H. SLAUGHTER, Dallas, Texas: It would seem that morphine is not contraindicated in duodenal hemorrhage and probably is indicated. In gastric hemorrhage it is probably contraindicated.

DR. JORDAN: Dr. Gold, are there any substitutes for atropine as a gastrointestinal antispasmodic that are of value?

DR. HARRY GOLD, New York: Several substitutes have recently received attention. One is novatropine, which is a compound closely related to homatropine. In animal experiments it was found to possess considerable peripheral effect or action with relatively few central actions. Clinical observations have not been especially favorable, however, and I doubt that it has any material advantage over atropine. Another is syntropan. It is one of the tropic acid esters and has two kinds of actions, one directly on smooth muscle and the other on the parasympathetic nerve in relation to parasympathetic nerve endings. The pattern of its effects is different from that of atropine, and it is possible that it has been found in some human observations that a dose which caused a relaxation of the large bowel, for example, and relaxation of the tone and diminution in the peristaltic activity produced those effects without any central effects and without any salutary pupillary effects. Trasentin¹ is another compound which is not related chemically to atropine. It is stated by the manufacturer to be the hydrochloride of the diphenylacetyl ester of diethylaminoethanol and it possesses little parasympathetic action. Its action is almost entirely confined, from the standpoint of the gastrointestinal tract, to the smooth muscle. It is a compound that in the animal experiments can counteract the direct and powerful effects of solution of posterior pituitary and barium salts, effects which cannot be counteracted to any appreciable extent by atropine.

It seems to be a fairly satisfactory compound for relieving gastric intestinal spasm, used in large doses, 75 mg. three, four or five times a day by mouth, and 75 mg. doses can be given by intravenous injection.

DR. JORDAN: Dr. Morgan, does liquid petrolatum interfere with absorption from the intestinal tract by coating the intestine with heavy oil?

DR. JAMES W. MORGAN, San Francisco: I think so. There are supposed to be five million villi in the

14. Channon, H. J., and Collinson, G. A.: *J. Biochem.* **23**: 676, 1929.

15. Twort, J. M., and Twort, C. C.: *Lancet* **1**: 448 (Feb. 27) 1932. Tamm, E.: *Tumori* **21**: 266, 1935; *Arch. Ist. biochim. ital.* **1**: 27 (March) 1935. Carminati, V.: *Sperimentale, Arch. di biol.* **55**: 564, 1934.

1. Trasentin is the trade name under which Ciba Pharmaceutical Products, Inc., markets a synthetic antispasmodic. The preparation has not been submitted to and does not therefore stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

small intestine. I feel that oil does adhere to the mucosa and thereby interferes with absorption; however, there is no proof.

DR. JORDAN: Dr. Morgan, will you comment on the use of oil retention enemas in the treatment of constipation?

DR. MORGAN: It is perfectly all right. Certainly liquid petrolatum introduced into the anus or into the rectum does a person less harm than if it is taken by mouth.

ANTHELMINTICS

DR. JORDAN: Dr. Faust, is a large dose of emetine more desirable than the same amount given in smaller doses over a longer period of time? If so, how large a dose can be used?

DR. ERNEST CARROLL FAUST, New Orleans: Emetine is a dangerous drug if given in excessive amounts. I think it is agreed that it should not be given in excess of 1 grain (0.06 Gm.) a day, and not in excess of a total of 12 grains (0.78 Gm.) over any one particular period. The reaction of the patient over a period of several months following should be given careful consideration before additional emetine is administered. If emetine were known to be an ameba-eradicating drug one might be justified in giving more, but in view of the fact that it is not usually an ameba-eradicating drug I don't believe one should go beyond this total.

DR. JORDAN: Dr. Faust, what are the relative indications for administering oleoresin of aspidium and carbon tetrachloride in tapeworm infection?

DR. FAUST: The two drugs appear to be equally efficacious under adequate management. The two are approximately equally toxic. The oleoresin of male fern has the advantage that following its administration the tapeworm, when freed from the bowel, is passed, in 90 per cent of the cases, with the head in a recognizable condition; therefore one can definitely evaluate the efficacy of the treatment. On the other hand, carbon tetrachloride frequently causes digestion of the more delicate parts of the tapeworm, including the head and neck, so that one cannot make any definite post-treatment diagnosis as to its removal, and therefore one would have to wait for from three to six months to determine whether cure has been effected.

DR. JORDAN: Dr. Faust, why may chiniofon be regarded as preferable to dodoquin in the treatment of amebiasis?

DR. FAUST: The advocates of dodoquin state that it is more satisfactory because it has a higher iodine content than chiniofon. They also state that it is much less likely to be absorbed from the bowel wall and therefore less likely to produce toxic systemic effects. On the other hand, chiniofon is accompanied in many cases by watery diarrhea, and some of us are firmly convinced that hyperperistalsis of the bowel is a very useful adjuvant in washing out little lacunae in which the amebas may be pocketed, thus giving them the immediate effect of the drug.

DR. JORDAN: Dr. Faust, is routine purgation with sodium sulfate before and after treatment with anthelmintics justified?

DR. FAUST: It depends on the helminthiasis which is being treated and the drug which is being used. If carbon tetrachloride, tetrachlorethylene, oil of chenopodium or oleoresin of male fern is used, it is definitely necessary to clean out the bowel beforehand and also after treatment, in order to have minimal absorption of

these products through the intestinal wall. Furthermore, in the case of a large worm, such as a tapeworm or *Ascaris*, it is highly desirable not to have the decomposing by-products of the worm absorbed from the intestinal wall into the system, so that it serves a double purpose, first in cleaning out the bowel beforehand, so that one can get maximal action of the drug, and then this protecting of the system from absorption of the drug. I believe that sodium sulfate is preferable whenever there is no contraindication to saline purgation, to magnesium sulfate, particularly in tapeworm and hookworm infection, because it tends to dissolve the mucus from around the heads of the worm, thereby allowing the drug to act much more efficiently and much more rapidly.

DRUGS THAT ACT PERIPHERALLY

DR. JORDAN: Dr. Gold, how does amphetamine stand as an antispasmodic?

DR. GOLD: The evidence regarding amphetamine is equivocal. Some clinical observations indicate that it increases the speed of emptying of the stomach. There is also evidence that amphetamine sulfate is useful in relaxing the spasm of the large bowel and the colon, in the treatment of the irritable colon. However, there is about as good evidence on the other side. Experimental evidence regarding action on the bowel is also equivocal. There is as much evidence to show that it increases spasm as that it relaxes spasm.

DR. JORDAN: Is atropine of any value against spasm caused by drugs such as mecholy?l?

DR. GOLD: Atropine is not very effective against the vagal substance liberated by stimulation of the vagus. Mecholy?l is dangerous to use without having a bedpan around for emergency. The danger is not grave, because within two or three minutes after the severe cramps appear after the injection a dose of $\frac{1}{100}$ grain (0.00065 Gm.) of atropine will abolish the effect with great rapidity.

DR. JORDAN: Is there any objection to solution of posterior pituitary for postoperative distention?

DR. GOLD: This question is related to some of the disagreeable symptoms of solution of posterior pituitary. It stimulates the primary arteries and causes coronary constriction. Also there is constriction of the cutaneous vessels and a disagreeable type of pallor which occurs in patients getting solution of posterior pituitary for the relief of postoperative distention. Not only does the drug stimulate the smooth muscle of the intestine but it causes blanching of the blood vessels of the intestine. There may be some objection to solution of posterior pituitary on the score of interference with the circulation in the intestine. The vascular action in the intestine is rather long lasting, sometimes several hours after a single, relatively small, dose.

DR. JORDAN: Dr. Slaughter, how do codeine and pantopon compare in action with morphine?

DR. SLAUGHTER: Codeine and pantopon act similarly so far as the gastrointestinal tract is concerned, when one compares them with morphine. Codeine is much weaker in its effectiveness, as one might expect. Pantopon, of course, in doses which are comparable to therapeutic doses of morphine, does not have as much effect as morphine though its actions are similar.

DR. JORDAN: Dr. Slaughter, what would be the optimal dose of morphine and prostigmine for routine prevention of postoperative ileus?

DR. SLAUGHTER: I cannot give an exact answer. I believe that the optimal dose is $\frac{1}{8}$ grain (0.008 Gm) of morphine plus $\frac{1}{30}$ grain (0.0005 Gm.) of prostigmine. That dose may be repeated in two hours if necessary, and it may be repeated every two hours for four doses. If afraid of too much hypnosis by repeating the combination of morphine and prostigmine, one may use the prostigmine alone. Of course, if desired for the relief of pain, the morphine and prostigmine could be given together every two hours for perhaps four doses; otherwise one might use prostigmine alone after the first dose of morphine and prostigmine.

DR. JORDAN: Dr. Faust, would you comment on control of nausea in administration of gentian violet for pinworms and also would you recommend treating all members of the household in which there is a case of oxyuriasis even if some are negative for ova?

DR. FAUST: I cannot answer the first question. I wish I knew the cause of nausea and vomiting in Oxyuris infection. Apparently there is something existent there which is not present in Strongyloides infection and which frequently occurs before gentian violet therapy. In over 100 cases in a children's institution some three years ago, almost all of them were positive for pinworm and all were given treatment. Ninety per cent had nausea or vomiting or both, although in only 1 case of the 90 per cent was there more than one vomitus; in other words, while the percentage of nausea and vomiting was high, the actual percentage, based on the number of days in which administration of the drug was given, was relatively low, only about 3 or 4 per cent of the total number of administrations. Certainly in strongyloidosis there is a much lower percentage of nausea and vomiting. I feel that it is justifiable for all members of the group to be treated. It must be remembered that adequate pretreatment diagnosis requires at least six consecutive cellophane anal swabs, and frequently it is neither convenient nor possible to get that many from all members of the family. Usually if two or three members of a family of five or six are positive, it is reasonably certain that most of the others are also.

USES OF LIQUID PETROLATUM

DR. JORDAN: Dr. Morgan, is it permissible to use liquid petrolatum in salad dressing?

DR. MORGAN: The only reason I can see for using it is that it is cheap. Liquid petrolatum costs 4 cents a gallon to produce. Almost all that is used in this country comes from Bakersfield, Calif., and it has the same cost as gasoline. It is a by-product. I don't believe that it is good for any one. The same holds true for petrolatum.

DR. JORDAN: Dr. Morgan, what substitute do you suggest for liquid petrolatum?

DR. MORGAN: There is none. I do not know of a good laxative.

DR. JORDAN: Dr. Morgan, is the use of liquid petrolatum indicated in diverticulosis or diverticulitis?

DR. MORGAN: In almost all of the textbooks the patient with diverticulitis is sentenced to an existence with liquid petrolatum. Diverticula in the descending colon have hard fecal masses in them, and the giving of liquid petrolatum will render them soft and liquid. I think, however, that it would be preferable, in the case of a ruptured diverticulum, to have a hard fecal mass get loose in the peritoneal cavity rather than a

pint of liquid feces. I take issue with all the authorities who prescribe liquid petrolatum day after day a month after month for diverticulosis. I think it is wrong.

DR. JORDAN: Dr. Morgan, what is the action of emulsions of liquid petrolatum?

DR. MORGAN: They are not much different except they are not quite so bad. There is less liquid petrolatum in them. It is not possible to get more than 40 per cent by weight, 60 per cent by volume of liquid petrolatum into an emulsion.

DR. JORDAN: Would you say, Dr. Morgan, that the danger of constipation is more talked of than real?

DR. MORGAN: I don't think there is nearly as much danger as most people think.

DR. JORDAN: Dr. Faust, what is your idea as to the pathologic significance of *Amoeba coli*?

DR. FAUST: I don't think *Entamoeba coli* has any grounds to stand on as a pathogen.

DR. JORDAN: Dr. Gold, is there any objection to routine use of prostigmine postoperatively? What about pitressin?

DR. GOLD: I think there isn't any particular objection to the routine postoperative use of prostigmine. There is a class of individuals that is sensitive to the parasympathetic drugs and drugs as a whole. Those who have had attacks of bronchial asthma or who have shown other signs of allergy would be particularly likely to be sensitive. The patient with susceptibility to bronchial asthma does have difficulty. A dose of prostigmine or any one of the parasympathetic groups precipitates attacks. Statements made about proprietary preparations of solution of posterior pituitary apply to pitressin. The suspicion of coronary disease is a contraindication. Caution ought to be used also in anybody past the age of 50. Pitressin has exactly the same action in practically the same doses.

DR. JORDAN: Will you comment on the use of atropine and glyceryl trinitrate for control of gallbladder colic, as compared to morphine?

DR. GOLD: Morphine doesn't relax the gallbladder biliary passages at all, does it?

DR. SLAUGHTER: No.

DR. GOLD: On the contrary, it causes spasm of the biliary passages. It does relieve an attack of gallbladder pain or biliary colic because it raises the central threshold to the perception of pain and the attitude toward pain, but by its action directly on the muscle it would tend to increase pain. The nitrites and atropine have the reverse effect: they relax directly the biliary passages. There are human experiments with biliary fistulas in which the relationship between the effects of these drugs was demonstrated, the rise of the pressure in the biliary passages due to spasm, with morphine, and the relaxation in these passages after the administration of the nitrites.

DR. JORDAN: Dr. Slaughter, would you define the use of morphine or morphine and prostigmine in peritonitis to limit peristalsis and thus the spread of infection?

DR. SLAUGHTER: The subject is an old controversy between the experimenter and the clinician. Cushny once said that the reason the clinician is afraid to use morphine is that he is not sure whether the patient has peritonitis or not. I was taught in school that morphine would cover up certain symptoms because the patient

would be more relaxed as the result of the hypnosis of the morphine action. Maybe in peritonitis one should not have the bowel at complete rest, and by "complete rest" I mean relaxation. There have been numerous clinical reports which show that there is apparently no danger of rupture from the use of this drug in peritonitis.

DR. JORDAN: Dr. Faust, what is the objection to treparsol or acetarsone? Also is the treatment of amebiasis by combined chiniofon retention enema and emetine bismuth iodide as effective or more so than any other?

DR. FAUST: When I first went to China in 1919 the drugs which were available for amebiasis were ipecac, emetine bismuth iodide, bismuth and alcresta tablets of ipecac, as well as emetine; following that acetarsone came to be used and was found to be superior, but even in a patient who did not have an arsenic idiosyncrasy it frequently produced such intestinal colic that the patient was in dire pain and distress throughout the whole period of treatment. Then came the preparation properly named by the American Medical Association chiniofon, which appeared to have all the advantages of acetarsone with few, if any, of the contraindications.

DR. JORDAN: Dr. Morgan, on what grounds do you base such a drastic statement as that the use of liquid petrolatum delays healing of rectal wounds?

DR. MORGAN: On personal observation with fistulas, after excising them. Wounds have healed quicker and better since I discontinued the use of liquid petrolatum. It has been used for a long time and is going to be hard to give up.

DR. JORDAN: Dr. Gold, what should be taken for gallbladder colic?

DR. GOLD: I had no idea of suggesting that morphine doesn't relieve an attack of gallbladder colic. It certainly does, but the fact remains that what one gets is the sum of effects with opposite signs, the relief of the subjective sensation of pain, while at the same time one does some harm by making the spasm worse; but the sum of the two opposite effects is still relief of the pain. Morphine is indicated and perhaps glyceryl trinitrate in repeated doses at the same time. Atropine might be given with the idea of overcoming the spasm produced by the morphine.

DR. JORDAN: Dr. Gold, how is the apparent clinical effect of atropine in relieving spasm in the bowel explained?

DR. GOLD: I do not believe that the doses of atropine ordinarily used are effective.

DR. JORDAN: What is the most effective antispasmodic drug used to relieve spasm in the colon?

DR. GOLD: The evidence is in favor of trasantin. Atropine in large doses does relax the large bowel. Beyond those two I don't think there is anything worth discussing.

DR. JORDAN: I have also found that trasantin has been most valuable in relieving spasm of the colon. Dr. Gold, what evidence have you to show that atropine will not relax the pylorus in routine roentgen ray examination?

DR. GOLD: Weiss and his collaborators in Boston have published some reports, and there are others who state that atropine doesn't relieve spasm of the stomach of the pylorus.

DR. JORDAN: What is the motility response of the stomach and sigmoid following administration of standard drugs?

DR. GOLD: The motility response of the stomach to atropine is one of reduction, the motility diminishes, and the peristaltic frequency and height of the peristaltic wave are affected. In the sigmoid the same effects have been obtained. That is true also of trasantin in both the lower bowel and the stomach. In regard to the parasympathetic stimulants, exactly the reverse is the case. Prostigmine and mecholyl increase the motility of both the sigmoid and the stomach.

DR. FRANK E. HAMILTON, Columbus, Ohio: For several years the Surgical Department of the Ohio State University College of Medicine has been investigating the motility of the gastrointestinal tract in man, following administration of drugs. Our studies have been limited exclusively to hospitalized patients. The group with me has been able to confirm all of Vetch's work; moreover, atropine has proved to be the most consistent drug. While these differences exist which Dr. Slaughter and Dr. Gold have mentioned, I can't explain them at this time.

DR. JORDAN: Dr. Michael Weingarten wishes to discuss the question of liquid petrolatum.

DR. MICHAEL WEINGARTEN, New York: Dr. Morgan has made a strong indictment of liquid petrolatum. I want to add another point. Under certain circumstances it may be dangerous to give liquid petrolatum. In patients who are regurgitating food, in patients with bulbar palsy, in old or debilitated patients, restricted to a recumbent position, or who have a Levin tube in situ, or dysphagia from any cause, liquid petrolatum may be aspirated and cause an oil aspiration pneumonia. Patients with cardiospasm frequently develop an anesthesia of the pharynx and food regurgitated at night is aspirated into the lung, and, while food is irritating to tracheal and bronchial mucosa and induces the cough reflex, liquid petrolatum is not irritating and does not do so.

DR. JORDAN: Would Dr. Morgan advise against administration of liquid petrolatum over a short period of time in order to reestablish regular bowel function in constipation?

DR. MORGAN: I don't have any particular objection to a few doses of liquid petrolatum, of course, but what happens? The patients do not stop. They are started in the hospital or during confinement, or with an operation, and they don't stop when they go home.

DR. JORDAN: What are the allergic manifestations of some of the gums used as laxatives?

DR. MORGAN: I don't know. There are over a hundred of the gums on the market. The difficulty I have found has been that the patients will not tolerate them for great lengths of time. They are certainly, the great majority of them, not particularly harmful.

DR. JORDAN: Dr. Gold, is there any particular advantage to the combination of bismuth subgallate and belladonna as in B & B capsules?

DR. GOLD: I know of none.

DR. JORDAN: We are probably not going to use atropine any more, and I am sure we are not going to use liquid petrolatum, but perhaps we have added a few valuable drugs.

MATERNAL PULMONARY EMBOLISM BY AMNIOTIC FLUID

AS A CAUSE OF OBSTETRIC SHOCK AND UNEXPECTED DEATHS IN OBSTETRICS

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(Concluded from page 1254)

INCIDENCE

It is impossible to state the true incidence of this condition at the present time because the sublethal and even subclinical forms which undoubtedly exist have not been recognized. The nonfatal cases on theoretical grounds should outnumber those which are fatal, just as is true with respect to pulmonary fat embolism and pulmonary embolism by vascular thrombi. In the absence of other data, only the incidence of fatal cases can be given.

The 8 cases reported here were encountered in 4,000 consecutive autopsies performed by members of the Department of Pathology of the University of Chicago between the years 1925 and 1940. This is an incidence of 0.2 per cent. This autopsy material was obtained from a number of private and charity hospitals and, on the whole, it is not dissimilar to that encountered in general postmortem services at other institutions.

Of greater significance is the frequency of this complication to total confinements. In a period of more than nine years, during which there were 24,200 deliveries at the Chicago Lying-in Hospital, pulmonary embolism of this type occurred three times. Thus its incidence was about 1 in 8,000 obstetric cases.

Its incidence can also be compared with that of the other commonly recognized obstetric complications which produce death. This has been done and the data summarized in table 7. In this table are given the causes of death of 72 obstetric patients encountered among the same 4,000 consecutive autopsies. Only those patients dying from the seventh month of gestation on through the puerperium are included. Thus early septic abortions and the toxemias of early pregnancy are excluded.

This analysis shows that pulmonary embolism by amniotic fluid and its pathologic contents was the most common cause of death in the period during labor and within the first nine hours thereafter. Instead of being considered a rarity among serious obstetric complications, this must be thought of as one of the commonest.

PREDISPOSING FACTORS

It appears that despite the limitations imposed by a series of only 8 cases certain factors by their frequent or constant occurrence can be pointed out as predisposing to this form of embolism. These include age, parity, tone of the uterus, character of the amniotic fluid and condition of the baby with special reference to its size and its viability. The detailed data for each case are given in table 8.

Age.—The age of these pregnant women is greater than that of a group of similar size selected at random. The 2 Negro women and 1 white woman were under 30 years of age. The youngest was 25 and the oldest was 42. The average age was about 32.

Parity.—With 1 exception these 8 women were multiparas. This seems to be significant and not mere chance.

Tone of the Uterus.—The uterine contractions of these women were stronger than usual, and there were 2 instances of uterine tetany. In 2 cases we have no record but in the others the pains were described as "violent," "powerful" and "hard." In 1 there was sudden unexpected expulsion of the baby. In another the uterine contractions were so powerful as to lead to rupture of the uterus. It is quite possible that these excessively powerful uterine contractions (1) prepared a route for the entrance of the emboli into the maternal uterine sinuses by loosening or tearing the placenta and membranes and (2) then forced the emboli into these channels, also by their force. It is difficult to believe them unrelated to the embolism.

Character of the Amniotic Fluid.—In the 4 cases in which the amniotic fluid was seen it contained meconium. In 1 and possibly 2 of these it also contained blood. The fluid appeared to be infected in case 6. Data on the character of the fluid are not available in the other 4 cases, but, since in 2 of them the fetuses were known to be dead for three and two weeks respectively, it is not improbable that in these also the amniotic fluid contained meconium. Since these fetuses were macerated the amniotic fluid must have had an excess of particulate matter. The character of the amniotic fluid is probably related to the embolism.

Size of the Fetus.—Six fetuses weighed respectively 5,568, 5,180, 4,604, 4,086, 3,632 and 3,510 Gm. (normal weight is 3,400 Gm.⁵). The sixth fetus had been dead for two weeks before term. These weights are of course exceptionally large. In general the weight of the fetus shows some correlation with the age of the mother and her parity, and in general those with large fetuses have a tendency to postpartum hemorrhage. The theoretical relationships of these things to the uterine contractions and to the pathogenesis of the embolism will be discussed under that head.

Viability of the Fetus.—Four of these fetuses were dead before labor began. Another was in poor condition at birth and survived for only a few hours. The relationship of intrauterine fetal death to the increase of particulate matter in the amniotic fluid, meconium and epithelium is well known. As far as we are aware, nothing is known about the effects of a dead fetus on the strength of the fetal membranes. These theoretical considerations will also be discussed later. How the dead fetuses were related to the excessively powerful uterine contractions and to the ease with which such contractions might cause an anatomic opening to the maternal circulation, possibly at the placenta, is unknown, although these phenomena are probably related.

Maternal habitus, length of pregnancy, duration of labor and initial blood pressure did not appear to be factors in the embolism. Some interrelations between certain of the factors given are discussed by Koff and Potter.⁶

PATHOGENESIS

There can be no doubt about the nature of the pulmonary emboli in these cases and little doubt as to their having come from the uterus. The exact mechanism

5. Potter, Edith L., and Adair, F. L.: *Fetal and Neonatal Death*, Chicago, University of Chicago Press, 1940, p. 25.
6. Koff, A. K., and Potter, Edith L.: *The Complications Associated with Excessive Development of the Human Fetus*, *Am. J. Obst. & Gynec.* 38: 412-421 (Sept.) 1939.

by which the embolic material gained entrance to the maternal circulation is not clear because it has not been seen. Since this possibility was not apparent at the time of delivery or autopsy, the fetal membranes and the placentas were not examined carefully for minute defects which must be present to allow entrance of the material into the maternal circulation. The presence of meconium-like mucus in the uterine veins in case 4, illustrated in figure 18, clearly shows that the probable source was from the uterus.

In discussions on postpartum shock and collapse it is sometimes stated that they do not follow cesarean sections.⁷ In such instances there are no powerful uterine contractions on enclosed amniotic fluid. This is additional evidence for the pathogenesis of the embolism here proposed.

Having gained entrance to the maternal systemic venous system, the emboli would be carried to the first filter bed, in these instances the lungs, and would lodge in vessels corresponding to their size. Sudden showers

TABLE 7—Causes of Deaths in Obstetrics

	Eclampsia	Post-partum Hemorrhage	Rheumatic Heart Disease	Rupture of Uterus	Pulmonary Embolism by Amniotic Fluid	Pulmonary Embolism by Vascular Thrombi	Puerperal Sepsis, Streptococcus	Miscellaneous and Untyped Sepsis	Pneumonia	Miscellaneous
Before or during delivery	1	..	3	1	2			1 Bacillus welchii	..	1 myocardial infarct
Delivery to 9 hours	2	7	2	2	6	.	.	..	..	1 air embolism 1 drug sensitivity 1 collapse—cause ?
10 to 24 hours	2	..	1	..	..		..	1 ? 1 diphtheria	3	
25 to 48 hours	..	..	..	.	..	.	.	..	1	1 acute leukemia
49 hours to 7 days	.	.	1	.	.		1	1 Bacillus coli	..	
8 to 14 days	.	..	..	.	..	1	7	1 Gonococcus 1 Bacillus tetani 1 Bacillus coli 1 Scarlet fever streptococcus 1 mixed 2 ?	1	2 nephritis 1 cerebral thrombosis
15 to 21 days	.	.	.	..	..	1	.	.	..
22 to 28 days	..	..		..	..	.	..	.	.	1 gonococci endocarditis 1 tuberculous meningitis 1 miliary tuberculosis
29 days	.	..	.	.	..	..	2	2 ?	..	1 nephritis
Total.	5	7	7	3	8	2	10	13	5	12

TABLE 8—Summary of Miscellaneous Clinical Data

Case	Age	Parity	Survival After Delivery	Survival After Onset of Shock	Condition of Fetus		Amniotic Fluid	Estimated Blood Loss in Cc	Treatment		
					Weight in Grams	Viability			Intravenous Fluids	Hypodermoclysis	Blood Transfusion, Cc.
1	30	ii	2 hrs., 25 min	3 hrs., 45 min	No record	Dead for 2 wks	No record	400	0	1,000 cc	550
2	26	i	Undelivered	1 hr	3,510	Yes, until mother died	Meconium	None	0	Yes	0
3	28	iv	8 hrs.	8+ hrs	4,056	Living	Meconium	1,500	100 cc	1,000 cc.	500
4	37	iii	1½ hrs.	11½ hrs (?)	4,604	Dead	Meconium and old blood	1,000	0	+	0
5	42	vi	55 min	50 min	No record	Living	No record	400	0	0	0
6	34	ii	2 hrs.	5 hrs	3,180	Dead about 8 hrs	Meconium	1,000+	500 cc	1,000 cc	200
7	33	iv	2 hrs	2 hrs	3,568	Living	No record	500	0	0	0
8	25	i	Undelivered	2 hrs	3,632	Dead for 2 wks	No record	0	Yes	0	0

Powerful or tetanic uterine contractions, such as were present in at least 6 of these women, acting on amniotic fluid rich in vernix caseosa and/or meconium which is entrapped in a closed space either because the membranes had not ruptured at the cervix or because the fetus in the birth passages blocked the effective escape of the fluid, probably produced the embolism. Circumstantial evidence for a tear in the fetal membranes or the placenta is offered by the presence of blood in the amniotic fluid, stated to have been present in two cases and unstated in the others. Whether the laceration is in the placenta, at its margin or elsewhere is uncertain.

of foreign particulate material lodging in the lungs may produce severe systemic reactions resembling shock or anaphylactoid reactions. Mild forms of such shock are familiar to every one who has witnessed the reactions which are produced by the administration of unclean intravenous fluids, the transfusion of incompatible blood which produced clumping of red cells or the accidental intravascular injection of drugs not intended for this route of administration, such as bismuth preparations in an oil vehicle.

7 Davis, E. P. Sudden Death During or Immediately After the Termination of Pregnancy or Operation on the Pelvic Organs in Women. Tr. Am. Gynec. Soc. 30: 345-366, 1905

Reactions produced by these procedures and others are often introduced by a chill, and indeed 6 of the women here described had chills at the onset of their illness. Perhaps it would not be amiss to suggest that a chill occurring during labor or in the very early puerperium is not necessarily evidence of a beginning



Fig. 17 (case 3)—Dilated pulmonary artery showing a mixed embolus. It consists of meconium mucus, epithelial squamæ, amorphous debris (vernix caseosa) and leukocytes, $\times 120$

bacterial invasion, but it may mean pulmonary embolism of this small, disseminated type, especially if it is accompanied by dyspnea.

De Lee,⁸ in discussing the clinical picture of women who died unexpectedly during labor or soon thereafter in whom at autopsy there was no anatomic explanation for death, made the remarkably acute observation that the picture resembled that of anaphylactic shock. As far as we are aware, the clinical pictures of anaphylactoid reactions and of anaphylactic shock are identical, although the causes are entirely different, the latter being dependent on a previous sensitization of smooth muscle by an antigen with shock induced by a subsequent reapplication of the antigen, and the former being nonspecific and having no necessary precursors. In the women here described the picture was that of profound shock not unlike anaphylactoid reactions and not unlike the reactions seen in our experimental animals.

It is not necessary here to go into the fundamental mechanisms of anaphylactoid reactions even if this were possible. In them, just as in those of anaphylactic shock, there are profound disturbances in tone in the smooth muscle of the various tubal systems of the body. In some places the smooth muscle is atonic while at the same time in other systems it is in contraction. Species differences exist that determine which smooth muscle shall be relaxed and which shall be tonic. Thus in some species of animals bronchospasm develops and in others spasm of the splanchnic area, perhaps during the same time that vascular tone is lost with a resultant fall in blood pressure. In this connection it is important to recall that in 5 of the 6 women who had been delivered, the uterine tone was poor and the patient was in shock. The uterine atony may have been due to the shock just as was their low blood pressure. We wish to suggest that one cause of postpartum atony of the

uterus may be milder forms of shock, perhaps anaphylactoid shock due to the mechanism described here.

Postpartum uterine atony predisposes to postpartum hemorrhage. Three of these women had such hemorrhage. In them, however, the history is clear that the shock preceded the hemorrhage and not vice versa. Two women had uterine packs although they had not had hemorrhage. In them, apparently, the shock was recognized and falsely attributed to internal hemorrhage.

It is not wise to imply that the sole direct cause of death of all of these women was anaphylactoid shock, although it appears to have been so in some of them. An anaphylactoid reaction, if it produced postpartum hemorrhage, might be fatal, owing to the combination. This seemed true in our cases 1, 3, 4 and 8. Also an anaphylactoid shock which might in itself be sublethal could be fatal if it was accompanied by the development of pulmonary edema. Finally, combinations of anaphylactoid shock, uterine hemorrhage and pulmonary edema might be fatal in combination in cases in which any of the three alone might be survived.

The general clinical pictures produced by this form of embolism and by pulmonary fat embolism are almost identical. In the acute stage, if the embolism is heavy, both are characterized by profound shock with a fall in blood pressure, rapid thready pulse, cold clammy skin, dyspnea, pallor and the like. In fatal cases of pulmonary fat embolism the amount of occlusion of pulmonary vessels is often no greater than that present here. This is additional circumstantial evidence for the importance of the embolism in these women.

Presumably the general condition of the patient is an important factor also. In a woman who has just come through an exhausting labor, has lost some blood and has not yet readjusted her vascular system to the sudden



Fig. 18—Edematous uterine wall beneath the placental site showing a uterine vein cut at three levels, all filled by a mucous embolus containing leukocytes, $\times 100$

decompression of the abdomen and lower extremities, the shock picture and collapse can be caused by a lesser degree of embolism than it could in a normal person. Survival in these cases was not exactly proportional to the amount of embolism, indicating that other factors were operating. Patient 3 survived longest, yet the embolism was among the heaviest.

⁸ De Lee, J. B.: *The Principles and Practice of Obstetrics*, ed. 6, Philadelphia, W. B. Saunders Company, 1933, pp. 862-864

The condition of the heart found at autopsy is important in pointing to the lungs as being the major seat of disease. With one exception (and here the post-mortem changes rendered the observation valueless) the left ventricle was contracted. Microscopic studies of the myocardium revealed no important abnormalities. Since



Fig. 19 (case 2).—Epithelial squamæ are seen as emboli in the glomerular tuft of the kidney; $\times 350$.

it is known that these women had acute pulmonary edema in the presence of anatomically normal hearts, also known to be functionally competent up to that time, it becomes highly probable that the cause of the edema was in the lungs themselves. With comparable degrees of pulmonary obstruction by emboli and normal hearts in the rabbits and dogs pulmonary edema also developed, presumably on the same basis.

On theoretical and experimental grounds (see summary and bibliography by de Takats and his associates⁹), it is highly improbable that the pulmonary emboli produce their profound effects merely by mechanical obstruction of blood vessels. Probably reflexes are initiated in the lung which produce vascular spasm in the lung and a depressant action on the heart. Both of these would further embarrass circulation through the lungs. Atropinization of the dogs preceding embolization of their lungs by an amniotic fluid-meconium mixture, already described, seemed to decrease the severity of the shock reaction slightly only if the embolizing dose was not overwhelming. This problem merits further study.

DIAGNOSIS

The diagnosis of this condition at the present time depends on the demonstration in the lung on microscopic section of rather massive embolism by the particulate matter of amniotic fluid. The clinical diagnosis should, however, become possible in the future. The picture previously described in the summary of the clinical histories of these patients, taken in conjunction with other data, should be sufficient to make the diagnosis during life. Profound shock coming on suddenly and unexpectedly in a woman who is in unusually severe labor or has just finished such a labor, especially if she is an elderly multipara with an excessively large, per-

haps dead, fetus and with meconium in the amniotic fluid, should lead to a suspicion of this possibility. If, also, the shock is introduced by a chill which is followed by dyspnea, cyanosis, vomiting, restlessness and the like and is accompanied by a pronounced fall in blood pressure and a rapid, weak pulse, the picture is more complete. If pulmonary edema now develops quickly in the known absence of previously existing heart disease the diagnosis is reasonably certain.

A number of conditions must be considered in the differential diagnosis. In this series of 8 cases the commonest clinical diagnosis was postpartum hemorrhage. The diagnosis of embolism rather than primary hemorrhage must be considered if the shock preceded the hemorrhage, or if the amount of hemorrhage is insufficient to explain the degree of shock. Also, in primary postpartum hemorrhage pulmonary edema does not develop, and its presence should help in the differential diagnosis.

Placenta praevia, mentioned once in the clinical diagnosis, should not offer serious confusion, but abruptio placentae is more difficult to distinguish. In it the shock is delayed and is less profound, and pulmonary edema is not present.

Clinically, pulmonary air embolism would be extremely difficult to distinguish but it occurs in obstetrics only after delivery, and so it need not be considered seriously in cases of shock coming on during labor.

Pulmonary embolism by large vascular thrombi also should not present serious difficulty. It usually occurs later in the puerperium, having its maximum incidence between the ninth and the fourteenth day. It is usually preceded by evidence of venous thrombosis, commonly in the legs. In those cases in which death is not almost instantaneous the patient has pain in the chest, a bloody sputum develops and soon there are roentgen signs of an infarct, together with a pleural friction rub.

So-called acute idiopathic edema of the lungs in obstetric practice, as is mentioned elsewhere in this paper, possibly represents a sublethal form of amniotic fluid embolism. In it massive pulmonary edema dominates the picture, and there is not the profound shock evident in the more serious forms. If fatal cases occur in the future special attention should be given to the microscopic examination of the pulmonary arteries.

"Eclampsia without convulsions" must also be differentiated in some instances unless toxemia is definitely present in the form of elevation of the pressure and albuminuria, headaches and the like. But in the absence of these it is quite possible that some cases considered to be eclampsia without convulsion may be mild forms of amniotic fluid embolism. It is stated by Teel and his associates¹⁰ that dyspnea and acute pulmonary edema are commoner in the nonconvulsive than in the convulsive types of eclampsia, and in view of the previous statement about acute pulmonary edema this may be taken as presumptive evidence for the identity of these conditions in some cases.

TREATMENT

In the absence of specific experience recommendations with respect to treatment can be only tentative and are based on what has been tried and what should be tried in view of the pathologic changes and symptoms.

9. de Takats, Geza; Beck, W. C.; Fenn, G. K.; Roth, Eunice F. and Schweitzer, Cesar: Pulmonary Embolism. Experimental and Clinical Study, *Surgery* 6: 339-367 (Sept.) 1939.

10. Teel, H. M., Reid, D. E., and Hertig, A. T.: Cardiac Arrhythmia and Acute Pulmonary Edema. Complications of Nonconvulsive Toxemia of Pregnancy, *Surg., Gynec. & Obst.* 64: 32-50 (Jan.) 1937.

In regard to prophylactic measures, several suggestions can be made. If vernix caseosa in excess is indicative of a vitamin A deficiency in the mother, as was recently suggested by Straumfjord,¹¹ its prevention should decrease the danger of this form of embolism. The prevention of the meconium component of the emboli would depend on controlling those conditions which lead to the presence of meconium in the amniotic fluid and those which prevent its free drainage from the uterus once it is present. Uterine tetany should be considered to be potentially dangerous.

Once the embolism has occurred, efforts in treatment should be directed first toward combating shock, such measures being avoided which might hasten the formation of pulmonary edema, and then treating pulmonary edema if it unavoidably forms. Uterine hemorrhage, if it occurs on the basis of atony, should cease if the treatment of the shock is successful.

On the basis of experimental work and on theoretical grounds the first consideration should be (a) to abolish reflex vascular spasms of the pulmonary vessels in order to diminish the obstruction to the pulmonary circulation of blood and thus prevent pulmonary edema and (b) to abolish cardiac depressor reflexes from the lung. The first should be accomplished with papaverine hydrochloride and the second with atropine.⁹

If pulmonary edema was an important contributing factor in the death of these women it should be prevented. Unfortunately two measures commonly used to combat shock aid the formation of pulmonary edema when the shock is of the type here described. These are the administration of epinephrine and the transfusion of blood. Both tend to increase the pulmonary hypertension already present because of mechanical plus spastic obstruction to pulmonary blood flow in the presence of an adequate myocardium, and thus they lead to edema. Epinephrine is probably contraindicated in these women, and transfusion of blood is indicated only in those cases in which loss of blood has occurred to the degree that it in itself has contributed to the shock picture. Rather than a blood transfusion, withdrawal of blood may be indicated in those cases in which the pulmonary edema is severe, the heart is adequate and there has been no excessive hemorrhage. If edema has developed oxygen should be administered.

A blood transfusion was performed, without appreciable benefit, in 3 of these 8 cases.

In general the comments made with respect to blood transfusions apply also to the subcutaneous or intravenous injection of fluids. They had been given in 6 of these cases. One form of anaphylactoid-like reaction¹² could sometimes be successfully treated simply by "breaking" the pulmonary spasm with artificial respiration until normal breathing was resumed.

Many other forms of drug stimulation of the heart and of respiration were tried in these cases, but without success. Drugs for the heart with the digitalis-like action were ineffective probably because of their delay in action, but also because the difficulty is not primarily in the heart. Drugs which stimulated primarily the respiratory center in the medulla probably failed for the same reason.

Since vasodilatation of the pulmonary vessels sufficient to permit passage of the emboli through the lungs cannot be accomplished because of the disproportion between the size of the emboli and the pulmonary capillary bed, efforts should be directed toward combating shock, restoring vascular tone and minimizing the dangers from pulmonary edema and its sequelae.

GENERAL COMMENT

A host of questions and problems are raised by this presentation, and some of these must remain unanswered. Certain proposals can be made, and possible correlations can be suggested with conditions which have been described in the literature but whose nature is uncertain.

A fairly exhaustive search of the literature has not disclosed any description of embolism by amniotic fluid, although embolism by placental fragments, as a sub-clinical, incidental pathologic finding, has been recognized.² However, there are many reports dealing with sudden death during or just after labor in which the symptomatology had a striking resemblance to that described here. Davis⁷ in 1905 made an exhaustive study of the reports of such sudden deaths, of which he found 125 instances up to that time. He presented a valuable table giving detailed data on 25 of the most typical cases, but he failed to find an adequate explanation for the deaths. In table 9 are presented data on 11 additional cases of sudden death taken from the literature since 1905, which probably are examples of the type which we have been describing. Additional suspicious cases collected from the literature but omitted from the table because of inadequate data are those of Manet¹³ (50 cases), Rémy¹⁴ (3 cases), Arderodias¹⁵ (2 cases), Icasalequi¹⁶ (2 cases), Rice¹⁷ (1 case) and Verco¹⁸ (1 case).

The theories of the causes of these sudden deaths vary with the author. Death has been attributed to a hypersensitive vagus,¹⁹ hypertonus of the vagus or parasympathetic system resulting in paralysis of the vessels of the splanchnic area with resultant "intravascular bleeding" and shock,²⁰ "facultative invalidism of the heart,"²¹ intraventricular thrombosis,⁷ external hemorrhage,²² internal hemorrhage of a ruptured uterus and eclampsia without convulsions.²³ De Lee⁸ pointed out the similarity of the symptoms to those of anaphylactic shock.

It is impossible for us to state definitely that the cases reported here were due to the type of pulmonary embolism which we have described, because in not a single instance was there a detailed description of the microscopic picture of the lungs. In all probability a

13. de Manet, Jean: Sur un cas d'autointoxication gravidique avec mort rapide après l'accouchement, Thesis, Paris, no. 385, 1924; cited by Mandelstamm.²¹

14. Rémy, S.: Trois cas de mort pendant la période d'expulsion de l'accouchement, Rev. méd. de l'est 39: 321-324, 1907.

15. Arderodias, J.: Un cas de mort pendant l'accouchement, Mandelstamm.²¹

16. Icasalequi, J.: Un caso de edema agudo del pulmón en el parto y en el puerperio, Rev. méd. de l'est 39: 321-324, 1907; abstracted Internat. Abs., April, 1919; abstracted Internat. Abs., October 1919.

17. Rice, P. W., and Opit, L.: Hyperacute Pulmonary Edema Occurring in Labor, M. J. Australia 1: 744-745 (June 1) 1929.

18. Verco, S. M.: Superacute Pulmonary Edema Complicating the First Stage of Labor, M. J. Australia 2: 462-463 (Nov. 29) 1919.

19. Maniscalco, S.: Considerazioni su un caso di asma bronchiale in gravidanza, Arch. di ostet. e ginec. 19: 403-407 (Sept.) 1932.

20. Pinard, cited by Mandelstamm,²¹ p. 549; Ludwig.²²

21. Mandelstamm, A.: Zur Frage des Geburtsschocks und des plötzlichen Todes nach der Geburt, Arch. f. Gynäk. 138: 543-557, 1929.

22. Ludwig, cited by Mandelstamm,²¹ p. 547.

23. Schickelé, G.: Toxémie gravidique ou choc obstétrical? Mort subite après l'accouchement, Gynec. et obst. 9: 123-135 (Jan.-June) 1924.

Gross, A.: De l'état syncopal et de l'état de choc chez les accouchées, Rev. franç. de gynéc. et d'obst. 18: 209-250 (April) 1923.

11. Straumfjord, J. V.: Vernix Caseosa: A Manifestation of Vitamin A Deficiency: Preliminary Report, West J. Surg. 48: 341-351 (June) 1940.

12. Steiner, P. E.: Fatal Pseudoanaphylaxis by Intramuscular Injection to Benzene and Related Substances, J. Immunol. 27: 525-530 (Dec.) 1934.

Careful examination of the pulmonary tissues would disclose that at least some of them present this disease. Also, a review of the lung sections in all other cases of sudden, unexpected death in obstetrics in which autopsy had disclosed no important gross changes except possibly pulmonary edema would probably reveal many additional examples.

It is possible that embolism of the fetal lungs by amniotic fluid may also be discovered in the future as a cause of fetal deaths. The anatomic factors are against this happening readily, but it is theoretically possible. Amniotic fluid trapped between the placenta and the uterine wall at the moment of a severe contraction could pass into the fetal circulation after passing through the delicate, anatomic fetal barrier.

The relationship of the pulmonary embolism to the picture of anaphylactoid (not anaphylactic) shock, and to uterine atony with hemorrhage, as one manifestation of the dysfunction of smooth muscle in this shock is especially intriguing. In a state of atony some uteri refuse to respond normally to the drugs which contract uterine smooth muscle. A systematic investigation of such women with respect to the state of other parts of their smooth muscle (e. g. blood pressure) and to their lungs might disclose that many of them are in mild general shock and that the shock is associated with pulmonary embolism.

As far as our own pathologic records are concerned "obstetric shock" as a cause of death no longer exists. All cases previously so considered are now explained on the basis of this form of embolism. We do not wish to generalize and claim that this will be the experience of others and that all cases of obstetric shock will fall into this group for them.

SUMMARY

On the basis of a study of 8 women, together with experiments on animals, a new obstetric disease was recognized which has its distinctive symptomatology, etiology and pathology. The series is composed of cases which previously had been called obstetric shock, idiopathic postpartum uterine atony with hemorrhage, acute pulmonary edema of pregnancy and other obscure diseases, for all of which a causation had not previously been known.

Clinically the disease is characterized by shock coming on during labor or soon after its conclusion.

Predisposing factors are uterine tetany or exceptionally strong uterine contractions, meconium in the amniotic fluid, intra-uterine death of the fetus, an over-size baby, multiparity and advancing age of the mother.

The essential pathologic condition is found on microscopic examination of the lungs. It consists of widespread embolism of small pulmonary arteries, arterioles and capillaries by the particulate matter found in amniotic fluid and by meconium.

The disease was duplicated clinically and pathologically in rabbits and dogs by the intravenous injection of human amniotic fluid and meconium.

The incidence of fatal cases was 0.2 per cent in general autopsies, and 1:8,000 confinements. The incidence of sublethal cases is unknown, but these cases probably outnumber the fatalities. It was the commonest cause of obstetric death during labor or in the first ten hours of the puerperium.

The diagnosis during life should become possible in the future.

CHEMOTHERAPY AND HEPARIN IN SUBACUTE BACTERIAL ENDOCARDITIS

FURTHER EXPERIENCES

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In 1939 Kelson and White¹ published a preliminary report from the Massachusetts General Hospital on the treatment of bacterial endocarditis with chemical agents and heparin. In their original group there were two apparent recoveries out of 7 patients treated, a proportion of favorable results which was sufficiently encouraging to warrant testing out the method in a larger group of cases. In order to make the series as large as possible it was arranged to pool the experience of several clinics in Boston for a year beginning in the fall of 1939, using a more or less uniform therapeutic technic and giving the heparin to about half the patients, in order to assemble control cases for comparison with those heparinized. The present report is the result of this joint study undertaken by Drs. Leach, Porter and White at the Massachusetts General Hospital, who contributed 25 cases (including the 7 previously reported); by Drs. Faulkner and Duncan at the Boston City Hospital and the Massachusetts Memorial Hospitals, who contributed 12 cases, and by Dr. Sylvester McGinn at the Robert Breck Brigham Hospital, who contributed 4 cases in addition to assisting with some of the cases at the Massachusetts General Hospital. The total number of patients treated by the group was 41.

In each case at least three positive blood cultures were obtained before starting treatment. The basic plan of treatment was as follows: An initial dose of 2 Gm. of sulfapyridine was followed by another 2 Gm. in two hours, following which 1 Gm. was given every four hours until the blood level of free sulfapyridine had reached as near as possible to 10 mg. per hundred cubic centimeters. The dose was then adjusted to maintain this level. In many cases there was a rapid decline in the temperature to approximately normal. When the temperature had been approximately normal for a week or ten days, heparin was given to a certain number of the patients by continuous intravenous drip in sufficient quantity to keep the clotting time at approximately one hour as measured by the "five tube" method. Usually 20 cc. of heparin per thousand cubic centimeters of solution (isotonic saline or dextrose) at a rate of 15 to 20 drops per minute produced the desired prolongation of the clotting time. This amount of solution lasted about twenty-four hours. Variations

Read in large part before the New England Heart Association, Massachusetts General Hospital, Boston, Dec. 16, 1940.

1. Kelson, Saul R., and White, Paul D.: A New Method of Treatment of Subacute Bacterial Endocarditis, *J. A. M. A.* 113:1700 (Nov. 4) 1939.

in the fluid intake were made by varying the concentration of the solution and the rate of flow according to individual requirements. In most instances a standard intravenous needle which was strapped in place with adhesive tape was more satisfactory than a cannula and caused less irritation. The heparin was continued for from two to three weeks. The sulfapyridine was continued for at least two months longer. Several

TABLE 1.—Results of Chemotherapy With and Without Heparin in 41 Cases of Subacute Bacterial Endocarditis

	Apparent Cures	Temporary Improvement	No Effect	Dead	Total Cases
No heparin.....	1	7	10	17	18
Little heparin.....	0	3	3	6	6
Part course.....	1	1	3	4	5
Full course.....	2	8	2	10	12
Totals.....	4	19	18	37	41

variations were made on the basic plan. Somewhat more than half (23) of the patients received heparin as well as chemotherapy, of whom 6 had, however, but little heparin; the rest (18 patients) had chemotherapy alone (that is, without heparin); a third of the patients had sulfathiazole as well as or instead of sulfapyridine.

During this period, high caloric and high vitamin diets were given, in most cases supplemented by ascorbic acid and iron. Transfusions and other supportive measures were carried out as indicated.

The results of chemotherapy of various types with and without heparin are compared in table 1.

Among the 41 patients there was complete and apparently permanent remission in 3 treated with heparin and chemical agents, and in 1 treated with chemical agents alone. The fact that 3 of these 4 patients received heparin in addition to the sulfonamides might suggest that heparin played the dominant role in the successful management of these cases. However, it must be remembered that heparin was used chiefly in those cases which had shown a good and somewhat prolonged response to chemotherapy, and it is quite possible that the clinical improvement might have continued without the use of heparin. On the other hand, despite our fears and several early instances, the administration of heparin did not seem appreciably to increase the incidence of cerebral vascular accidents, this complication having occurred thirteen times in patients during heparinization and sixteen times in patients not under the effect of heparin. From a statistical standpoint, however, these figures do not give the true picture, since the duration of heparinization in patient-days is a great deal less than the period of nonheparinization.

Table 2 indicates the results obtained with various chemotherapeutic agents. The numbers refer to the courses of drugs given and are larger than the number of patients because some patients were given more than one drug. In this table the relative worths of the different compounds are not fairly evaluated, since sulfapyridine was used most frequently and several patients received no other drug. Furthermore, the other drugs in general were given only to those individuals who reacted badly to sulfapyridine or had no effect from it. Thus, the other products were administered in the most difficult cases rather than in a cross section of the whole group. Four of the drugs—sulfamethylthiazole, sulfanilamide, neoarsphenamine and sodium paranitrobenzoate—were not used exten-

sively enough to allow a fair evaluation of their effectiveness. In the cases in which they were used they appeared to be entirely ineffective. In general, sulfapyridine appeared to be more effective than sulfathiazole in sterilizing the blood stream and reducing the temperature, but the latter drug was not used in the most favorable cases. This less effectiveness may have been due in part also to difficulty in maintaining a high blood level of sulfathiazole because of its rapid excretion. The 2 patients who received sulfathiazole and recovered also had a course of sulfapyridine with therapeutic though toxic effect; it is probable, though not certain, that the pyridine was the important drug in these cases.

A number of the temporary remissions were of considerable duration—from one to five months—and during this period the patients gained in appetite, weight, strength, hemoglobin and general sense of well-being. For these patients it was felt that the treatment had been worth while in spite of the fatal outcome.

In our experience no patient responded favorably to chemotherapy who did not show a favorable effect within a week after the beginning of treatment. In a number of instances because of failure to respond to sulfapyridine a shift was made to sulfathiazole or vice versa. In few cases, however, was the hope fulfilled that the second drug would succeed where the first one had failed.

The occurrence of toxic reactions to the drugs proved to be a major problem in the handling of these cases. In roughly one third of the cases a sensitivity reaction of sufficient severity developed to prevent further use of the offending drug. Nausea and sometimes vomiting were the most frequent adverse effects, occurring regularly with sulfapyridine and less frequently with the other agents. This, however, did not interfere with therapy in most instances. Dermatitis was the next most frequent reaction, occurring in about one third of the cases with sulfathiazole and about one fifth of the cases with sulfapyridine. Hyperpyrexia occurred four times with sulfapyridine and three times with

TABLE 2.—Results with Various Chemotherapeutic Agents

	Effect on Blood Cultures *				Effect on Fever		
	Total	No Effect	Temporary	Permanent	No Effect	Temporary	Permanent
Sulfapyridine...	36	10	17	4	5	27	4†
Sulfathiazole...	14	7	2	2	8	4	2†
Sulfamethylthiazole	2	2	0	0	2	0	0
Sulfanilamide...	3	3	0	0	3	0	0
Neoarsphenamine	3	2	0	0	3	0	0
Sodium paranitrobenzoate	3	2	0	0	3	0	0
Grand total...	61	26	19	6	24	31	4

* Blood cultures were not taken during the administration of every chemotherapeutic agent.

† Two patients had sulfathiazole and sulfapyridine with no evidence of infection during the few days intervening between the drugs.

sulfathiazole. This reaction was of particular interest because the temperature returned temporarily to normal after discontinuance of the drug and in nearly all instances a normal temperature was maintained for several days thereafter. In one instance complete recovery apparently followed such a reaction. Agranulocytosis developed in 3 patients while on sulfapyridine, while severe anemia occurred twice with sulfapyridine and once with sulfamethylthiazole. Peripheral neuritis developed in 1 case on sulfamethylthiazole and in 1

case on neosarsphenamine. We were unable to evaluate the renal effects from the drugs alone, since the underlying disease itself could be responsible for urinary changes. In most instances it appeared that patients exhibiting toxic reactions to one drug tended to have adverse reactions to other drugs which were administered later. Practically all of the severe reactions resulted from the use of sulfapyridine. Sulfathiazole was much better tolerated by the gastrointestinal tract but was more likely to give rise to a troublesome rash.

In two cases the effect of heparin alone was observed. It seemed possible that if heparin should be effective at all it might demonstrate its effectiveness without the complicating factor of chemotherapy. The reasoning was that in subacute bacterial endocarditis it may not be the bactericidal power of the blood which is at fault—indeed it is often very high in this condition—but rather the fact that the bacteria in the vegetation are protected from the antibodies in the blood stream by impenetrable layers of fibrin. It was hoped that, during the period of heparinization, no new fibrin would be laid down and at the same time the previously deposited fibrin would become organized into fibrous scar tissue which would not offer a favorable nidus for the organism.

Treatment of 1 patient with heparin alone was continued for nine days. During this period the patient became clinically worse, the temperature rose and the blood cultures remained positive. At the end of the ninth day the patient refused further heparin. Sulfapyridine therapy was begun at once on stopping the heparin. There was a prompt decline in temperature and the blood culture became negative for the first time but the patient died two days later. The clinical course of the second patient also changed rapidly for the worse on administration of heparin and on the fifth day the patient's condition was so alarming that it was decided to give sulfapyridine in addition to the heparin. When this was done the temperature began to fall and the patient improved clinically, the blood cultures becoming negative. In this case it was possible to complete a full three weeks course of heparin, and the patient survived for sixteen months on continuous chemotherapy although throughout most of this period the infection was active.

This experience, though very limited, indicates that heparin alone is probably ineffective. It remains possible, however, that it may act to support the chemotherapy by limiting or preventing the deposition of new thrombi into which the bacteria might penetrate to continue their growth.

Postmortem examination in several cases revealed little effect on the vegetations from either the chemotherapy or the heparin with one notable exception (case 2), which exhibited a completely healed subacute bacterial endocarditis. It was the rule to find the vegetations swarming with organisms in spite of high antemortem blood levels of the sulfonamides.

In respect to their response to chemotherapy the patients fall into three groups. The first group consists of those patients on whose infection the drug had no apparent effect, the blood cultures remaining positive and the temperature elevated in spite of high blood levels of the therapeutic agent. In these instances obviously the drug was lacking in bactericidal or bacteriostatic effect on the particular organism.

The second group is made up of those patients whose blood was sterilized for a period of time while under the influence of the drug but who nevertheless eventu-

ally succumbed to the disease. In some of these the organisms reappeared in the blood stream after weeks or months of negative blood cultures in spite of the fact that high blood levels of the chemotherapeutic agent were maintained. In some the blood cultures remained negative as long as the drug was administered but became positive again as soon as it was discontinued, while in others, although the blood cultures remained negative to the last, the vegetations were teeming with organisms on postmortem examination. Such a response to treatment could well be explained by the fact that the organisms lying deep in the vegetation are well protected from the circulating chemotherapeutic agents by the layers of fibrin which overlie them. It has been demonstrated that blood clots are impermeable to the sulfonamide drugs.²

The third group consists of the 4 patients (10 per cent) who have apparently been cured. The following is a summary of the 4 cases in which recovery from the subacute bacterial endocarditis has occurred to date:

CASE 1.—E. S., a man aged 21, single, unemployed, was admitted to the Massachusetts General Hospital on April 14, 1939 because of fatigue, anorexia, fever, headaches and chilly sensations of four days' duration. He had had rheumatic fever at the ages of 10, 11 and 13 years. Three blood cultures taken before admission were positive for *Streptococcus viridans*. He appeared poorly developed and nourished and chronically ill. The heart was enlarged, with systolic and diastolic murmurs heard at the apex and over the aortic area. The temperature was 104.6 F. rectally and the leukocyte count was 9,400. One additional blood culture was positive for alpha hemolytic streptococci. He was started on sulfapyridine 6 Gm. daily, the day of admission, and a blood level of 6.8 mg. per hundred cubic centimeters was obtained. The temperature fell to 101 the next day and persisted at about this level. At this time the patient began to complain of mild joint pains, and an electrocardiogram showed partial auriculoventricular block, suggesting the probability of complicating active rheumatic fever. A blood culture taken on the fourth day of treatment was positive, but one taken four days later was negative. On this day heparin was started and continued for two weeks. During this period, blood cultures remained negative and the rectal temperature dropped to 99 to 100 F. Sulfapyridine was continued for two weeks after the heparin was stopped, the temperature remaining normal and the blood sterile. After sulfapyridine was stopped, the temperature rose slightly but repeated blood cultures were negative. Migratory pains in the shoulders were controlled with acetylsalicylic acid. Subsequently, within a few weeks, the patient had auricular fibrillation, and digitalization was carried out. Slight fever persisted and the sedimentation rate was elevated. It was thought that the subacute bacterial endocarditis was arrested but that the patient now had acute rheumatic fever. He was discharged to the Robert Brigham Hospital on June 27. The patient gradually went downhill and died in congestive failure four months later (October 1939). At postmortem examination by Dr. Beach Hazard of the Faulkner Hospital there were found clear evidences of acute and chronic rheumatic heart disease in the myocardium and the endocardium respectively. There were also healed, calcified vegetations of bacterial endocarditis on the mitral valve (shown in the illustration). Ground fragments of these vegetations showed no growth on culture, culture of the heart's blood was negative, and microscopic examination of the involved valve and vegetations showed no bacteria. There was no doubt from either clinical or autopsy evidence that both rheumatic fever and subacute bacterial endocarditis were present in this patient, the latter progressing to complete healing.

CASE 2.—A. C., a woman aged 23, a housewife, was admitted to the Massachusetts General Hospital on April 15, 1939 because of chilly sensations, fever, malaise, transient scattered pains,

2. Duncan, C. N., and Faulkner, J. M.: The Penetration of Blood Clots by Sulfanilamide, Sulfapyridine, Sulfathiazole and Sulfamethylthiazole, *Am. J. M. Sc.* 200:492 (Oct.) 1940.

and sometimes nausea and vomiting for the past five months. She had had rheumatic fever at the age of 10. A blood culture taken three months before admission was positive for alpha hemolytic streptococci. She appeared undernourished, pale and in some distress. There were two petechiae on the left hand and left clavicle. There was no clubbing of the fingers or obvious splenomegaly. The heart was normal in size, with soft systolic murmurs heard at the apex and base. The temperature was 100.6 F. rectally and the white blood count was 14,000. Two further blood cultures were positive for alpha hemolytic streptococci. Sulfapyridine 6 Gm. daily was started on the seventh hospital day, and blood levels of 7.3 mg. per hundred cubic centimeters were obtained. The rectal temperature ranged between 98.6 and 100 F. and blood cultures became negative. Heparin was started on the seventeenth hospital day and continued to the thirty-fourth hospital day. Blood cultures continued negative and the temperature remained normal. There was constant clinical improvement, and no further petechiae appeared. Sulfapyridine was continued to the forty-second hospital day. After the drug was stopped, normal temperature persisted and six subsequent blood



Auricular surface and edge of opened mitral valve in case 1. The stenosis is evident along with thickening of the valve and of the chordae tendineae. On the right side of the valve there is seen a group of calcified healed vegetations remaining from the previous subacute bacterial endocarditis. The myocardium microscopically showed numerous Aschoff bodies.

cultures were negative. The patient was discharged July 1, 1939 looking well and feeling very fine. She has continued in good health ever since, except for an occasional minor "cold," and at the present time (June 1941) she is completely asymptomatic and working full time. Her heart shows no enlargement but a moderately loud apical systolic murmur.

CASE 3.—W. N., a man aged 21, a bar porter, was admitted to the Massachusetts General Hospital on June 12, 1940 because of fever, sweating, transient stabbing pains and general malaise of seven months' duration. At the age of 16 a diagnosis was made of congenital heart disease with patent ductus arteriosus. About five months before admission he was hospitalized elsewhere for study and told that he had a streptococcal infection in his blood. The patient was thin and appeared chronically ill. Physical examination revealed an enlarged heart and the characteristic thrill and murmur of a patent ductus arteriosus. The temperature ranged from 101 to 102 F. rectally. There was a moderate anemia, and the leukocyte count was 9,000. Four out of five blood cultures were positive for alpha hemolytic streptococci. After preliminary studies the patient was started on sulfapyridine 5 Gm. daily, and a blood level of 10.8 mg. per hundred cubic centimeters was obtained. The temperature became normal and remained so for ten days,

during which time the blood cultures became negative. At the end of this period the temperature gradually rose to 103 F. with an associated itching of the skin over the face and wrists. Because there were no other adverse findings sulfapyridine was continued, and by the fifteenth day of treatment the temperature had subsided to normal. On the seventeenth day of treatment heparin was started and continued to the twenty-first day, at which time both heparin and sulfapyridine were stopped because of a rise in temperature to 102.5 F. and the development of a confluent macular rash. For the next few days small doses of sulfapyridine were tried, but each resulted in the recurrence of the rash and a rise in temperature, both of which subsided when the drug was discontinued. After two days of rest, during which time the temperature rose as high as 100 F. rectally on one occasion, the patient was started on sulfathiazole 3 Gm. daily, which was gradually increased to 6 Gm. daily. Two cultures taken during this period were negative. On the seventh day of this therapy an erythema nodosa-like rash developed with a slight rise in temperature to 100.4 F. The dose of the drug was dropped to 3 Gm. daily and the temperature and rash subsided within the next three days. Sulfathiazole was continued at 3 Gm. daily and the temperature remained normal. At the time of discharge the red blood cell count was 5,000,000 and the leukocyte count was 5,200. For the next six months the patient continued taking sulfathiazole 3 Gm. daily and was followed at frequent intervals. He remained asymptomatic with normal temperature and negative blood cultures and led a fairly active existence. Six months after discharge the chemotherapy was discontinued with no return of symptoms or fever, and the blood cultures remained negative. On March 12, 1941, seven months after discharge and a month after treatment was stopped, ligation of the patent ductus arteriosus was carried out by Dr. Robert Gross at the Peter Bent Brigham Hospital. The patient was put back on sulfathiazole preoperatively and postoperatively for several days as a precautionary measure. At operation no evidence of subacute bacterial endocarditis was palpated, and after operation the patient made an excellent convalescence, being discharged home on the seventh post-operative day. Two months after operation (May 1941) the patient is in excellent health with no evidence of infection and is able to lead an active life without discomfort.^{2a}

CASE 4.—A 17 year old boy was admitted to the Boston City Hospital on account of fever, joint pains, nosebleeds and loss of weight of six weeks' duration. He had had growing pains in early childhood and had been treated for rheumatic fever at the Boston City Hospital (two years previous to this admission), at which time the development of an aortic diastolic murmur was observed. He presented the characteristic signs of free aortic insufficiency and in addition a temperature of 101 to 103 F. rectally, a palpable spleen, multiple petechiae, Osler's nodes and five successive positive blood cultures of *Streptococcus viridans*. Sulfathiazole was given for twelve days, the blood level being maintained at approximately 5 mg. per hundred cubic centimeters. On this regimen the temperature gradually rose until it reached 105.2 F. The drug was then discontinued and the temperature promptly fell to normal. After a six day interval, during which the temperature remained normal and a single blood culture was negative, sulfapyridine was started, but again the temperature began to climb. At the end of thirteen days it had reached 102 F. Since he was vomiting, the sulfapyridine was discontinued. Again the temperature fell abruptly to normal. Blood cultures were taken at three day intervals during treatment. The first was positive, there were then two negative cultures, and the last, taken on the twelfth day, was positive. The boy has received no further treatment and has been well and active ever since, a period of thirteen months to date (June 1941).

2a. This patient (W. N.), while in excellent health, was killed in an automobile accident on July 13, 1941. Autopsy revealed complete healing of the ligated ductus arteriosus. There were no vestiges left of the endarterial or endocardial inflammation except for a few small, slightly raised areas on the pulmonary artery close to the mouth of the ductus arteriosus and on the pulmonary aspects of the pulmonary valve cusps. The heart itself was normal except that it was very slightly hypertrophied, weighing 420 Gm.

SUMMARY AND CONCLUSIONS

1. Forty-one patients who had subacute bacterial endocarditis were treated with various sulfonamides and other chemical agents, and in half the cases with heparin also.

2. Remission of symptoms of varying duration followed the use of sulfapyridine in approximately one half of the cases. In 4 instances there was apparent permanent recovery, a small minority of 10 per cent, but larger than in previous experiences of ours, in which recovery occurred in less than 1 per cent.

3. Sulfapyridine and perhaps sulfathiazole are useful drugs in the treatment of subacute bacterial endocarditis.

4. Heparin has not alone been effective in the treatment of this disease, but it may have acted as a favorable adjunct in some of the cases in which recovery occurred (3 out of 4).

5. Further use of chemotherapy and of its evolution in subacute bacterial endocarditis, with or without the aid of other measures such as heparin, gives promise for the future.

COMMENT BY DR. KELSON³

I have used sulfapyridine in combination with heparin in the treatment of 27 patients, the first 7 of whom were the subject of a previous report.¹ Of this original group of 7, 2 have apparently recovered (patients 2 and 3 in the present paper). In addition, there was a third patient in this group whose condition was quiescent for two months following therapy. At the end of that time evidences of infection returned either because of a flareup of an almost quiescent infection or because of a recurrence of infection possibly resulting from a persistent dental infection. Subsequent treatment was without effect and the patient died.

Since this original group of 7 patients, I have had 20 additional patients under treatment in New York City with the following apparent recoveries: 1. J. R. has been well, active and free from evidence of disease since completing therapy in April 1940 (and is still well in June 1941). 2. L. B. has been well, active and free from evidence of disease since completing therapy in June 1940 (and is also still in excellent health in June 1941). 3. W. D. was well and active and without evidence of infection for several months following therapy, with a gain of 46 pounds (21 Kg.). Infection directly followed the extraction of two abscessed teeth three months later.⁴

Seven of these 20 patients had previously received sulfapyridine and had become resistant to it; in 5 others the strain of organism was such that the drug had had little or no effect from the start. Heparin is ineffective in both these groups and would not now be given. Strong bacteriostatic action of sulfapyridine with lowering of temperature to normal or near it and rendering of blood cultures negative is essential to success with the combined method. If sulfapyridine has been used previously and "escape" has occurred, further use of the drug usually has but little effect; the temperature can sometimes be lowered, particularly with large doses, but the blood cultures can rarely be ren-

dered negative. If the combined treatment is planned, it is most important that sulfapyridine be withheld until both drugs can be given; even small amounts of sulfapyridine used briefly may produce "fastness" and all chance of success by this method will be sacrificed.

Possible Harm from Heparin.—Pulmonary edema and peripheral congestion have resulted from the intravenous injection of large amounts of fluids; these are averted by use of more concentrated solutions of heparin (1 liter daily as a rule) with 5 per cent dextrose in distilled water instead of saline solution and by digitalizing in advance patients with low cardiac reserve. Lymphangitis at the site of the intravenous needle is readily overcome with change of the place of injection.

Cerebral deaths, very frequent in this disease, have occurred with equal or decreased incidence during heparin therapy. None of the 20 patients died of cerebral accidents while heparin was being given. Of the 17 patients treated without success, 6 died in such a manner long after the discontinuance of heparin and restoration to normal of blood coagulation. In 5 other instances such deaths have occurred one day or less before heparin was to have been started.

Evidence to Date of the Usefulness of Heparin.—Apart from the striking action of heparin *in vitro*, in experimental animals and clinically elsewhere in the body in arresting the deposition of platelets and fibrin, its use in subacute bacterial endocarditis is supported by (1) the apparent greater incidence of success with the combined therapy as compared with sulfapyridine alone and (2) the unusual degree of healing, often striking, noted independently by many observers in the vegetations of patients who have died during or shortly after the use of heparin.

ADDITIONAL NOTE, AS OF JUNE 1941, BY DRs.
PORTER AND WHITE

Since the original series of 25 cases from the Massachusetts General Hospital presented in the foregoing report, we have had 20 subsequent clearcut cases under treatment in this hospital. In all of these cases chemotherapy alone has been employed, that is, without heparin, to serve more or less as a control group. Two of the patients were very ill on admission, had only a few days of treatment and died shortly. The remainder have had a good trial of chemotherapy for from one to five months. For the most part we have initiated treatment with sulfapyridine, changing subsequently to sulfathiazole, to sulfanilamide and in 2 cases to sulfadiazine if the previous drugs were not tolerated or were ineffective. In a few instances sulfathiazole was the initial chemotherapeutic agent. Of this series 11 are now dead and the surviving 9 are showing evidences of active infection. It is still too soon to draw final conclusions from this series as a whole, although it can be said that several of the patients were at least temporarily benefited by the treatment.

One additional patient, whom we have not, however, included in the series of unquestionable cases because of lack of completely confirmatory criteria, seems to have had a favorable reaction to the therapy and at the present time (June 11, 1941) is completely free from symptoms and signs of infection, one month after all treatment has been stopped. This patient had rheumatic heart disease, aortic stenosis and insufficiency and mitral insufficiency and was admitted with multiple

3. Read before the New England Heart Association, Massachusetts General Hospital, Dec. 16, 1940.

4. This patient died in May 1941. Autopsy disclosed both healed and active lesions. In the opinion of Dr. Emanuel Libman and others, these findings confirmed the clinical impression of a new infection resulting from tooth extraction and not the flaring up of an infection rendered latent. This case stresses the importance of eradicating foci of possible reinfection before beginning treatment.

transient pains throughout his body, a temperature of 102 F., petechiae but no splenomegaly, and only one positive blood culture out of four taken. Hence he did not fulfil all our criteria for a clearcut case; nevertheless we felt that the diagnosis was subacute bacterial endocarditis.

In connection with the case cited in the preceding paragraph we would emphasize an opinion, held by others besides ourselves, which we believe of great importance although not as yet proved as fact: The more severe the infection, the more evidences thereof and the easier the diagnosis; the milder the infection, the fewer the signs thereof (including positive blood cultures) and the more difficult (less certain) the diagnosis. This last case to our mind represents a milder degree of the infection and the type of case in which therapy can be expected to do the most good.

After a rather prolonged trial of chemotherapeutic agents, 4 of this additional series of 20 patients were given hyperthermia in addition (by means of a fever cabinet by the kindness of Dr. John Gibson II of the Peter Bent Brigham Hospital) but without favorable effect.

SYPHILIS AMONG SELECTEES AND VOLUNTEERS

PREVALENCE IN FIRST MILLION MEN EXAMINED UNDER THE SELECTIVE SERVICE ACT OF 1940

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A rate of 45.2 cases of syphilis per thousand persons examined was found through physical examinations and routine serologic blood tests of the first million selectees and volunteers called for classification under the Selective Service Act of 1940. The examinations were made, and the blood specimens taken, by private physicians who volunteered their services to their local Selective Service boards. Nearly all of the men examined were between 21 and 35 years of age.

The physicians examined the selectees clinically for lesions of early syphilis and other evidence of the disease. The blood specimens were examined routinely in state and municipal laboratories or in laboratories designated by the state departments of health.

Standard quadruplicate reporting forms were adopted in the District of Columbia and all the states except Idaho, Kentucky, Oregon and Vermont. One of the forms was retained by the testing laboratory, one was returned to the examining physician and two were filed with the state health officer. The state health officers made one of their copies of the form available to the U. S. Public Health Service for statistical analysis. The Work Projects Administration assisted in these analyses and in completion of the statistical record.

The Selective Service Regulations on Physical Standards (volume VI, page 5) stated: "A second serological test shall be completed promptly and prior to his call for induction on every registrant whose first test is

reported positive." Presumably this procedure also was followed in the cases in which a doubtful test was reported. In a limited number of instances there was not time for a second test prior to the preparation of this manuscript.

For computing purposes the relatively small number of selectees with "doubtful" reports were considered

TABLE 1.—Prevalence of Syphilis Among the First Million Selectees and Volunteers by Race and States

(Based on routine serologic blood tests given during general physical examinations)

State	White Rate per 1,000	Negro Rate per 1,000	Syphilis	Number Tested	Rate per 1,000
Alabama	24.2	193.5	1,579	17,613	89.6
Arizona	50.5	298.9	223	2,927	76.2
Arkansas	20.6	275.6	1,360	13,148	103.4
California	21.2	184.3	2,281	84,479	27.0
Colorado	16.3	166.7	166	8,093	19.3
Connecticut	6.1	186.4	282	24,659	11.4
Delaware	15.6	229.4	141	2,611	53.4
Florida	46.8	401.8	3,044	17,000	170.1
Georgia	33.7	292.7	2,806	21,570	132.9
Illinois	16.2	187.9	482	21,264*	22.7
Indiana	23.3	234.6	974	28,433	34.3
Iowa	11.6	145.2	213	16,204	13.1
Kansas	16.6	212.2	388	14,311	27.1
Louisiana	32.0	247.2	3,080	24,344	126.0
Maine	25.9		178	6,621	26.9
Maryland	26.7	341.5	1,358	13,461	100.9
Massachusetts	5.5	76.6	124	17,542*	7.1
Michigan	11.2	150.2	1,122	58,885	19.1
Minnesota	7.1	120.0	240	29,232	8.2
Mississippi	29.9	284.0	3,175	22,059	143.9
Missouri	21.9	201.7	635	17,306*	36.7
Montana	12.0		85	5,766	14.7
Nebraska	7.9	166.7	145	14,594	9.9
Nevada	17.1		26	1,246	20.9
New Hampshire	6.1		13	2,249	5.8
New Jersey	10.0	164.3	1,167	52,121	22.4
New Mexico	44.0	364.3	381	7,261	52.0
New York	12.5	183.6	2,792	135,880	20.5
North Carolina	29.5	240.1	429	4,796*	89.4
North Dakota	5.9		35	4,982	7.1
Ohio	16.0	174.7	2,588	94,495	27.4
Oklahoma	30.6	217.7	1,363	25,400	53.6
Pennsylvania	14.7	174.5	1,470	68,982	21.0
Rhode Island	7.8	106.8	104	8,772	11.9
South Carolina	43.9	296.5	1,951	12,503	155.0
South Dakota	6.8		42	3,323	10.7
Tennessee	34.5	264.2	2,448	27,306	89.7
Texas	42.6	292.2	4,527	50,016	90.0
Utah	6.1	137.9	30	4,135	7.3
Washington	25.1	222.4	1,940	22,082	87.9
Wisconsin	10.7		22	9,635*	23.1
Wyoming	36.7	176.3	825	15,675	52.6
District of Columbia	5.1	147.9	151	24,066	6.3
	14.2		23	1,489	15.4
	21.4	262.7	1,094	10,615	103.1
Total	18.5	247.7	47,552	1,051,985	45.2

* Returns incomplete.

Data for Idaho, Kentucky, Oregon and Vermont are limited to the material compiled and supplied by the state health departments and did not include information on race.

as cases of syphilis. Preliminary reports from some state health departments indicate that considerably more than 10 per cent of those selectees found to have syphilis were under treatment at the time of their examination for classification. "Doubtful" routine test reports on such established cases of syphilis should certainly be classified as syphilis. Others in this group of cases under treatment undoubtedly were reported as negative in the testing program. Whether the cases of syphilis with negative blood tests are exactly compensated by those of uninfected men for whom "doubtful" reports were submitted cannot be ascertained, but it is obvious that these two groups tend to correct each other.

The Public Health Service received for tabulation 1,061,843 laboratory reports on the men examined from early November 1940 through April 15, 1941. Ninety-nine per cent, or 1,051,985 of these reports, carried the results of serologic blood tests. The completeness

of the reports was due in large part to the energetic support of the survey by the private physicians who volunteered their services as examiners for the local Selective Service boards.

Table 1 shows the prevalence of syphilis in the first million men examined by race and state. The greatest prevalence of syphilis among the selectees and volunteers was reported by Florida and South Carolina, with rates of 170.1 and 156 cases per thousand respectively. The lowest rate, of 58 per thousand, was reported by New Hampshire. Seven Southern states and the District of Columbia reported rates in excess of 100 cases per thousand. The rate for Negroes is consistently higher than that for white men in all the states. There are indications that high rates among the white are coincidental with high rates among the Negroes. For the country as a whole, the prevalence

TABLE 2—Prevalence of Syphilis Among the First Million Selectees and Volunteers in Various Communities

City	Syphilis	Total Tested	Rate per 1,000
1,000,000 and over, total	2,910	102,073	28.5
Chicago	22	1,025	21.5
Detroit	564	18,691	30.2
Los Angeles	624	17,617	35.4
New York City	1,243	53,773	23.1
Philadelphia	457	10,806	41.7
500,000 1,000,000, total	2,551	55,753	45.8
Baltimore	616	6,081	101.3
Boston	33	1,569	21.0
Buffalo	135	8,119	16.6
Cleveland	313	12,354	25.3
Milwaukee	52	4,490	11.6
Pittsburgh	86	4,040	21.3
St. Louis	38	980	38.8
San Francisco	184	7,505	24.5
Washington, D. C.	1,094	10,615	103.1
250,000 500,000, total	4,359	68,642	63.5
Atlanta, Ga.	437	2,630	162.5
Birmingham, Ala.	212	1,625	142.8
Cincinnati	384	7,029	54.6
Columbus	208	4,371	45.5
Dallas, Texas	380	2,684	141.6
Denver	57	2,187	26.1
Houston, Texas	567	4,217	134.5
Indianapolis	244	2,805	87.0
Jersey City, N. J.	39	3,088	12.6
Kansas City, Mo.	14	336	41.7
Louisville, Ky.			
Memphis, Tenn.	448	3,052	146.8
Minneapolis	70	5,347	13.1
Newark, N. J.	112	5,103	31.7
New Orleans	668	4,797	139.7
Oakland, Calif.	72	3,171	22.7
Portland, Ore.			
Providence, R. I.	58	3,374	17.2
Rochester, N. Y.	50	4,719	10.6
St. Paul	35	2,517	13.9
San Antonio, Texas	123	1,408	87.4
Seattle	4	80	50.0
Toledo, Ohio	107	3,842	27.9
100,000 250,000, total	3,448	75,305	45.8
50,000 100,000, total	3,475	62,549	55.6
25,000 50,000, total	2,375	65,599	36.2
10,000 25,000, total	4,171	59,159	46.8
5,000 10,000, total	3,726	64,765	51.4
2,500 5,000, total	2,687	49,615	54.2
City size unknown	434	7,820	55.5
Total urban	29,736	641,283	46.4
Total rural	17,023	40,181	42.2
Total residence unknown	793	7,521	105.4
Total United States	47,552	1,051,955	45.2

of syphilis among Negro selectees and volunteers is thirteen times that for the white. In twenty states and the District of Columbia the Negro rate is in excess of ten times that of the white rate.

Table 2 shows the prevalence of syphilis among selectees and volunteers, classified by the size of the community in which they resided. In those communities with populations above 250,000, information

is furnished for the specific locality. Philadelphia, with a rate of 41.7 per thousand, has the highest rate among the cities of 1,000,000 population or more; Washington, D. C., with a rate of 103.1 per thousand, is the highest among the cities from 500,000 to 1,000,000 population; and Atlanta, Ga., with a rate of 162.5 per thousand, is highest among the cities of 250,000 to 500,000 population.

It is interesting to note that the rates for cities of 1,000,000 and over reflect the intensity of the campaign against syphilis which has been waged in those communities. The high rates existing in cities of medium and small size show that the present program for the control of syphilis in such municipalities has not yet been prosecuted with sufficient vigor. Another interesting fact is the comparable extent of the problem in rural and urban areas. The figures for rural and urban residents are particularly valuable because of the difficulty of securing the accurate address of the infected person who ordinarily reports to available treatment sources.

A much more detailed analysis than the one given here will be made available to state health officers and to large medical libraries. It will show the complete results of these examinations for each political subdivision of 2,500 population or more.

Clinical Notes, Suggestions and New Instruments

THROMBOSIS OF INTERIOR TEMPORAL BRANCH OF THE RIGHT RETINAL VEIN SUCCESSFULLY TREATED WITH HEPARIN

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Among the recently developed clinical applications of heparin therapy is the treatment of thrombosis of the central retinal vein or its tributaries. Although it is likely that work had been done earlier and not reported, prominence was first given to the subject in 1938 when the *Lancet* published two articles with complete case reports. In the same year a third case was reported by Ploman¹ in *Acta ophthalmologica*.

Holmin and Ploman² describe the improvement in thrombosis of the central vein of the retina after treatment with heparin. Following this presentation by a few months was a paper by Bostrom and William-Olsson³ in which is recorded the satisfactory clinical course in a similar case under heparin therapy.

Prompted by the encouraging results thus reported, I elected to employ heparin in the treatment of a patient with thrombosis of the inferior temporal branch of the right central vein of the retina.

REPORT OF CASE

S., a white man aged 47, has been under treatment for hypertension for eighteen years, during which time the blood pressure has ranged from 165 systolic and 90 diastolic to 240 systolic and 110 diastolic. About a half a year before the present admission he was hospitalized for about two weeks because of severe headaches, pressure symptoms in the temporal and occipital regions and some numbness of the arms and fingers. About five years before there had been several attacks of renal colic which promptly disappeared after passage of the stones.

Dr. Farnsworth and the entire intern and nursing staff cooperated.
1. Ploman, K. G. Heparin Treatment of Thrombosis in Central Vein of Retina, *Acta ophth.* 16: 502, 1938.

2. Holmin, N., and Ploman, K. G. Thrombosis of Central Vein of Retina Treated with Heparin, *Lancet* 1: 664 (March 19) 1938.

3. Boström, C. G., and William-Olsson, Leslie. Thrombosis of Central Vein of Retina Successfully Treated with Heparin. A Second Case, *Lancet* 2: 78 (July 9) 1938.

Otherwise the patient observed nothing out of the way until July 8, 1940. On the morning of this day he suddenly noticed that his right eye did not seem to focus correctly and that vision in both eyes seemed slightly blurred. Within a few hours he discovered that the right eye was almost totally blind. During the next few weeks several ophthalmologic consultations were held and the diagnosis of thrombosis of the inferior temporal branch of the right central vein of the retina was confirmed. Two months after the onset of the condition vision in the affected eye was such that the patient could distinguish light and could detect a large object moving at a distance of 5 feet but could not recognize it; he was unable to read any size type at any distance. An ophthalmologist's report based on an examination at about the same time read: "On September 6, the vision in the right eye was 0.1. I detected a thrombosis of the inferior branch of the temporal vein $1\frac{1}{2}$ disk diameters below the disk, with extensive hemorrhages involving the lower half of the papillomacular bundle."

On September 24 the patient was hospitalized and active treatment was begun. At the time of admission the temperature, pulse and respiration were normal and the blood pressure was 140 systolic and 90 diastolic. Laboratory studies at this time revealed an erythrocyte count of 4,210,000 and a white blood cell count of 7,250 with a hemoglobin content of 14 Gm. (91 per cent). The blood coagulation time was three minutes and twenty seconds. Urinalysis was negative. A heparin solution¹ diluted with Ringer's solution and 5 per cent dextrose was administered by continuous intravenous infusion over a period of eight days. The actual quantity of heparin varied from day to day, depending on the clotting time level, but usually amounted to between five and eight vials of 5 cc. each. The total quantity of fluid introduced by vein in twenty-four hours averaged 2,000 cc. During the next six days the coagulation time varied from nine minutes and ten seconds to twenty-two minutes and forty-five seconds, which was seven times greater than the pretreatment coagulation time. No untoward effects were observed during or after the period of administration, although on the fifth day of treatment the temperature rose to 100.6 F., with a corresponding elevation of the pulse rate to 118. Both signs soon returned to a normal level, however, from which they showed no further deviation during the rest of the stay in the hospital. Four days after the infusion was started a recheck on the blood and urine was made with the following results: erythrocytes, 5,360,000; leukocytes, 6,450; hemoglobin, 17 Gm. (110 per cent); urine, traces of albumin. Determinations of the blood coagulation time, which were carried out routinely every four hours, showed the nocturnal values to be higher (i. e. longer coagulation time) than those recorded during the day.

On the third day after treatment was begun the patient was able to read the headlines of a newspaper at a distance of 5 feet. On the day that therapy was terminated he could read much smaller print than had been possible prior to heparinization. However, in order to cover the entire field of vision it was necessary for him to change the position of his head several times, suggesting the persistence of some of the clots. About two weeks later he demonstrated his ability to read with the affected eye and seemed to have difficulty only with very small print. The visual acuity at this time was estimated to be 0.8 or 0.9. An ophthalmologist again saw the patient and reported: "October 15. Vision has increased considerably. There has been some clearing of the hemorrhagic and exudative areas, and apparently there is some recanalization of the thrombosed vein."

COMMENT

The results in this case, though generally favorable, are not as dramatic as those reported in the literature. This, I believe, may be reasonably attributed to the relatively long

interval which elapsed between the onset of symptoms and the institution of treatment. In my opinion, in cases of thrombosis of the retinal vein, as well as in thrombosis elsewhere in the body, heparin therapy, in order to be of maximum benefit, should be undertaken as early as possible in the course of the disease process.

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DIABETES AND CEREBRAL NEOPLASM

A CASE OF SEVERE CONVULSIVE ATTACKS SIMULATING INSULIN SHOCK

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Convulsions often accompany hypoglycemic reactions in patients with severe diabetes. In the case here reported severe convulsive seizures which appeared to be preventable by allowing a high blood sugar to be maintained were due, it appears, not to the occurrence of hypoglycemia as at first supposed but apparently to the presence of edema in the tissues adjacent to a cerebral tumor, which edema could be for a time prevented by the general dehydration incident to allowing the diabetes to remain uncontrolled.

M. R. W., an unmarried woman who was 70 years old at the time of her death in January 1940, was first seen in the Rhode Island Hospital in April 1926. She had been in coma for four hours. With the use of insulin and intravenous fluids she made a good recovery. At that time she was known to have had diabetes for six years but had not kept the condition under good control. She was discharged on a diet containing approximately 110 Gm. of carbohydrates and yielding about 1,500 calories. Her insulin dosage was 35 units before breakfast and 25 units before her evening meal. For the next ten years she maintained only fair control of her diabetes. She was rather easily influenced by advertised nostrums and indulged in osteopathic treatment.

In the fall of 1926 herpes zoster and a severe neuritis developed and in September she was again admitted to the hospital for regulation of her diabetes. Her weight was 114 pounds (51.7 Kg.). She was admitted in March 1930 because of an infection of the upper respiratory tract. In 1932 her diet was recorded as containing 150 Gm. of carbohydrate and yielding 1,800 calories. Her insulin dosage of 55 units of "regular" insulin, in doses of 30, 10 and 15 units, gave fairly good control of the diabetes. The blood pressure was 163 systolic and 83 diastolic.

In December 1936 she was taken by an osteopathic physician into the osteopathic hospital in coma. She was doing badly and my colleague Dr. H. A. Lawson was called in and under his direction she was rescued again.

In the summer of 1939, while summering in Maine, she went into coma and was treated by Dr. B. O. Goodrich of Waterville. At this time her condition proved extremely difficult to control; she had several severe attacks of insulin hypoglycemia and a second attack of coma. She was finally discharged on a diet of 152 Gm. of carbohydrates and 1,566 calories, with 52 units of insulin in the morning and 15 in the evening. On her return to Providence she was readmitted immediately to the Rhode Island Hospital under Dr. Lawson's care and was discharged after a few days on practically the same regimen but with rather poor control of her glycosuria. This was partly explained by the fact that the patient insisted on taking her insulin after meals. Attempts to regulate her on protamine zinc insulin had not been successful and had succeeded only in giving the patient a deep though unintelligent prejudice against that form of treatment. However, after she was persuaded to take her insulin before her meals she achieved a fair degree of control of her condition and did reasonably well until November 21. There had been some loss of weight during the fourteen years during which she had been under observation, from 114 pounds in 1926 to about 100 pounds (45.4 Kg.) in 1940. Her eyesight had been distinctly failing

4. Liqueamin, obtained from Roche-Organon, Inc., Roche Park, Nutley, N. J.

owing to early cataracts, and mentally she had shown a tendency to depression at times which had not been at all characteristic. The following is taken from notes made at the bedside on November 22: On Nov. 21, 1939 (according to the history given by her family) an intense headache developed late in the afternoon. In the evening she became "distracted" with it and said that she was "going off her head." Toward midnight she became stuporous, rousing somewhat after drinking orange juice. At 1:15 a. m. she began to have convulsive twitching of the left side of her body, arm, leg and face which continued with increasing violence up to the time that she was seen at 2:10 a. m. November 22. When seen, she was having strong clonic spasms of rapid frequency involving the left side of the face, left arm, left side of the trunk and left leg. The eyes were deviated to the left, the pupils were equal and a rapid nystagmus was present. She indicated the left costal margin as the point of most severe suffering but could not speak because of the intense facial convulsions. While 50 per cent dextrose was being prepared, and after 2 cc. of 50 per cent magnesium sulfate had been given subcutaneously, a generalized convulsion suddenly developed, respirations ceased and cyanosis appeared. After several seconds relaxation occurred and respirations began, but left-sided spasms persisted. The blood pressure was 130 mm. systolic and 68 mm. diastolic. Fifty cc. of 50 per cent dextrose solution was then given into the femoral vein. During the next fifteen minutes the left-sided convulsive movements diminished. By 4 a. m., when the ambulance arrived, the patient was conscious, quiet and could talk.

In the hospital the patient was quiet but complained of a moderately severe headache. Her left arm was definitely weak and her left pupil was considered possibly slightly larger than her right. There were opacities in both lenses but the fundi could be seen, and no hemorrhages were noted. There was no blurring of the disks but the left seemed perhaps very slightly raised. The left biceps, triceps and patellar reflexes were definitely hyperactive, and the Babinski reflex was present on the right side.

On November 23 the patient showed a slight recurrence of clonic spasms on the left and the blood taken at that time showed 77 mg. of sugar per hundred cubic centimeters of blood. During the next few days it was found that whenever the urine was allowed to become sugar free mild spasms recurred. Since she was terribly apprehensive lest her convulsive state return and wished only to be allowed to die, she was given only small doses of insulin and the glycosuria was allowed to persist. She was discharged on a diet of 150 Gm. of carbohydrates with only 18 units of insulin (spaced 8-5-5) and was placed in a convalescent home. On this regimen, with glycosuria constantly present, she became stronger, developed a good appetite and, except for occasional periods of nervousness and depression, did surprisingly well.

On January 23 a five page letter was received from the patient written in pencil in her usual neat hand, although she said that her sight was so poor that she could not see what she had written. Her main complaint was a feeling as if her mouth were filled with sawdust and also that her whole left side tingled and was numb at times. Dr. Lawson had seen her a few days previously and at that time she had complained bitterly of a feeling as of saliva running from the left side of her mouth—although actually nothing of the kind was taking place.

On January 26, in the early morning hours, the patient had a convulsion and when seen by Dr. Lawson she was unconscious. The blood pressure was 110 systolic and 70 diastolic and there were moist rales throughout both lungs. She was admitted to the hospital and about two hours later another mild convulsion developed, beginning in the left hand and arm and later slightly involving the right hand. Respirations became slow and difficult and ceased in about two minutes. Blood removed at the time that this final convulsion began showed 900 mg. of dextrose per hundred cubic centimeters.

A postmortem examination was performed by Dr. Riddell and with histologic studies was later reported as follows by Dr. Robert J. Williams:

A spongioblastoma multiforme was found in the right parieto-occipital lobes. The tumor was well behind the motor area. In addition there was a well defined fibrous change in the pancreas. Interesting lesions found were (1) chronic cholecystitis, (2) cholelithiasis, (3) chronic cystitis, (4) a serous cystadenoma of the left ovary and (5) atrophy of the endometrium.

COMMENT

Insulin reactions and insulin shock take various and often quite bizarre forms. Convulsive seizures are common in patients with severe diabetes who are taking large doses of insulin. The convulsions may, it is said, be at times more severe on one side. In the instance here reported it seemed at first most probable that this was an acute hypoglycemia causing a convulsion which affected the left side more than the right because of some vascular anomaly or lesion due to arteriosclerosis of the cerebral vessels. The convulsions were definitely relieved by dextrose intravenously and could be prevented if any tendency to hypoglycemia could be avoided. In the light of the post-mortem findings it seems clear that the left-sided jacksonian epileptiform attacks and the headache were due to edema in the region of the tumor which involved the motor areas of the cortex and which could for a time be prevented by the dehydrating effect of hyperglycemia and glycosuria.

454 Angell Street.

SULFATHIAZOLE AS A CAUSE OF DEATH

REPORT OF PATIENT WITH ACUTE AGRANULOCYTOSIS

ARCHIBALD L. HOYNE, M.D., AND GRANVILLE W. LARIMORE, M.D., CHICAGO

It has been noted in general that toxic manifestations resulting from the administration of sulfathiazole have been less than those encountered with some of the other sulfonamide derivatives. However, nausea, vomiting, fever, rashes and erythema nodosum have been reported.

References in the literature to the effects of sulfathiazole on the production of granulocytes have been few.¹ Rheinhold, Flippin, and Schwartz² state in referring to the use of sulfathiazole that repeated blood counts and hemoglobin determinations made during the course of administration of the drug failed to show evidence of any unusual depression in the number of white or red blood cells or in the concentration of hemoglobin. Leser³ observed that Long and Bliss, while treating 271 patients for a variety of disorders with sulfathiazole, found that "leukopenia and granulocytopenia occurred but not a single case of acute agranulocytosis." He further states that to date no deaths from acute agranulocytosis have been reported following sulfathiazole therapy.

Our patient was one in whom acute agranulocytic angina with a fatal termination followed the taking of sulfathiazole over a comparatively long period of time. The death reported by Kennedy and Finland⁴ is the only one we have found recorded in the literature in which acute agranulocytosis might be attributed to the administration of sulfathiazole. In this instance, however, an extremely ill patient received also sulapyridine for two days prior to sulfathiazole therapy. Our patient is the first example, so far as we know, of an apparently well person in whom acute agranulocytosis developed after prolonged medication with sulfathiazole and during which time no other drug was used.

From the Municipal Contagious Disease Hospital, Chicago Health Department.

1. Pippin, B. I.: Staphylococcemia and Agranulocytosis with Special Reference to Drug (Sulfathiazole) Toxicity, Wisconsin M. J. 40: 194-195 (March) 1941.

2. Rheinhold, J. G.; Flippin, H. F., and Schwartz, Leon: Toxicology of Sulfathiazole in Man, Am. J. M. Sc. 199: 393-401 (March) 1940.

3. Leser, R. U.: Agranulocytic Angina (Especially Following Use of Sulfanilamide and Its Derivatives), J. Indiana M. A. 34: 64-66 (Feb.) 1941.

4. Kennedy, P. C., and Finland, Maxwell: Agranulocytosis from Sulfathiazole, J. A. M. A. 116: 295-296 (Jan. 25) 1941.

REPORT OF CASE

A white man aged 34 was sent to the Municipal Contagious Disease Hospital on March 9, 1941 with a diagnosis of laryngeal diphtheria.

The history obtained from relatives was sudden onset with chills, fever and sore throat. The sore throat became progressively worse, as did the general condition, until on admission to the hospital, which was the fourth day of illness, the patient was virtually moribund.

The occupational history was not significant; the patient was a cashier. It was stated that he had always enjoyed good health until Jan. 9, 1941, at which time, fearing that he had contracted gonorrhea, he visited a physician and related a story of venereal exposure and vague genitourinary symptoms. "There was no urethral discharge present." The physician prescribed sulfathiazole—daily dosage of 8 tablets of $7\frac{1}{2}$ grains (0.5 Gm.) each. The original prescription was for 20 tablets and instructions were to have it refilled only once.

However, according to relatives, the patient was able to obtain additional supplies of the drug and continued using it in varying amounts, taking from 2 to 8 tablets a day. He continued this medication until the onset of his illness on March 6. A bottle containing 6 tablets of sulfathiazole was brought to the hospital by relatives, who estimated that the patient took approximately 200 tablets (1,500 grains [100 Gm.]) during a period of nearly two months.

On admission the patient was fairly well nourished but somewhat dehydrated; he was semicomatose and was exhibiting labored and noisy respirations with slight infrasternal retractions. The pulse rate was 80 and of poor quality. Heart tones were distant. There were no murmurs. Coarse, moist rales were heard over the entire chest with poor ventilation of the lungs, particularly at the bases. The throat was moderately red and edematous with no membrane except for a thin gray-green film over the posterior pharyngeal wall. There was a moderate degree of cervical adenopathy and edema. The lips and finger nail beds were cyanotic. A slight inguinal adenopathy was present.

The temperature on admission was 102.4 F. and rose rapidly to 105. The urine showed a 1 plus albumin but was otherwise normal. The blood Wassermann reaction was reported later to be negative. Cultures for diphtheria of material taken from the nose and throat were also reported negative. The white blood cell count revealed but 200 cells per cubic millimeter. Stained blood smears showed only an occasional immature granulocyte. The red blood cell count was 4,960,000 with 85 per cent hemoglobin. No abnormal red cells were seen on smear.

Because of the labored respiratory effort the patient was placed immediately in an oxygen tent. Blood and intravenous fluids were administered. Death ensued nine hours after admission.

At autopsy the gross pathologic findings together with microscopic study of bone marrow sections confirmed the diagnosis of acute agranulocytic angina.

The pathologist, Dr. Victor Levine, reported the anatomic diagnosis based on the necropsy as follows:

1. Acute agranulocytosis with severe membranous and gangrenous pharyngitis and laryngitis.
2. Focal membranous tracheitis.
3. Focal hemorrhagic bronchopneumonia in the posterior portions of both lungs.
4. Severe edema of the pharynx and larynx.
5. Distinctive cloudy swelling of the myocardium, liver and kidneys.
6. Infectious softening of the spleen.
7. Extensive fat replacement of the thymus.
8. Diffuse fibrous adhesions of the posterior aspect of the left lung.
9. A single ulceration on the forehead.

3026 South California Avenue.

The Chemical Laboratory

THE A. M. A. CHEMICAL LABORATORY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. ALBERT E. SIDWELL JR., PH.D., Director.

CHEMISTRY OF ALUMINUM HYDROXIDE SUSPENSIONS

HENRY R. KREIDER JR., PH.D.
CHICAGO

The problem of the chemistry of aluminum hydroxide preparations was originally referred by the Council on Pharmacy and Chemistry to Dr. Victor C. Myers and his associates at Western Reserve University, Cleveland. In 1938 Dr. Myers compared the chemical properties of commercial products then available with a preparation made by a method devised by Dr. I. H. Einsel. This method depended on the possible intermediary formation of aluminum carbonate resulting from the double decomposition of equivalent quantities of aluminum chloride and sodium carbonate in aqueous solution. The aluminum carbonate hydrolyzes to form aluminum hydroxide and carbonic acid. Most of the carbonic acid is decomposed to form free carbon dioxide and water. The resulting mixture was adjusted to be slightly alkaline to phenol red. This material was then centrifuged, the supernatant liquid discarded and the residue made up to the original volume with water. This was again centrifuged, and the final residue constituted the preparation. Other laboratory preparations were made by additional washing.

The products prepared by the foregoing method were white and gelatinous, containing approximately 6 per cent of total solids. From the results of his analyses of these and the available commercial preparations, Dr. Myers suggested that an acceptable product should be labeled with the percentage content of aluminum hydroxide and also the percentage of the aluminum hydroxide that will combine with hydrochloric acid. He indicated that such products should contain from 4 to 6 per cent of aluminum hydroxide to avoid separation of the solid portion and to maintain a uniform suspension. It was pointed out that the small quantity of residual sodium chloride was not chemically objectionable in products prepared from aluminum chloride but that the percentage of this contaminant could serve as an index of the amount of washing to which the products had been subjected. He suggested that standards for the product should include data for total solids, sodium chloride and acid-combining power. He indicated that his data proved that the reaction of aluminum hydroxide with hydrochloric acid is a simple acid-base reaction rather than adsorption of the acid. The belief was expressed that a product of fairly stiff consistency was preferable as an aid in uniform dosage and that such a preparation could be satisfactorily diluted for use in continuous drip administration. Some of the commercial preparations were found to be too watery, too low in percentage of aluminum hydroxide or inadequate in acid-combining power.

In the further consideration of the aluminum hydroxide preparations recently undertaken by the Council on Pharmacy and Chemistry, additional chemical data were furnished by Dr. V. C. Myers and by the A. M. A. Chemical Laboratory. On the basis of further analyses of some of the commercial products, Dr. Myers pointed to the desirability of keeping the sodium chloride con-

centration at not more than 1 per cent. He found that some of the preparations contained variable amounts of unidentified inert substance and that the preparations of the Einsel type could not be pasteurized because heat reduces their neutralizing activity. He expressed the opinion that the amount of carbon dioxide liberated in this type of product was not sufficient to interfere with its clinical usefulness.

Aqueous specimens of seven commercial brands of so-called colloidal aluminum hydroxide obtained prior to 1940 have been examined by the A. M. A. Chemical Laboratory. The products varied in color from gray to white. Viscosity could not be determined accurately, owing to the fact that gelatinization occurred on standing and because the products became increasingly liquid with shaking. The products varied in consistency and tendency to "settle out." Each product possessed an odor indicative of peppermint. The results of chemical analysis are summarized in table 1. Letters refer to various products.

It may be noted that the acid-combining power is not exactly equivalent to the total solids or ash content because other factors are involved. The most

hydroxide with hydrochloric acid is not one of adsorption but rather chemical neutralization. This is shown in the accompanying graph. It was pointed out that the particles of aluminum hydroxide are charged posi-

TABLE 3—Results of Investigation

	pH	Aluminum Oxide Gm. per 100 Gm.	Chlorides Gm. per 100 Gm.	Sodium Chloride Gm. per 100 Gm.	Titration (N/10 HCl Gm.)	Specific Gravity	Carbon Dioxide Gm. per 100 Gm.
Product A	7.06	3.43	0.261	0.430	1325 cc.	1.032	0.45
Product C	7.23	2.78	0.203	0.335	1604 cc.	1.035	0.94
Product D	6.50	1.21	0.156	0.257	638 cc.	1.014	0.35
Product E	6.48	3.39	0.108	0.179	1997 cc.	1.039	1.22
Product G	6.53	3.55	0.161	0.265	1413 cc.	1.058	1.10

tively and would therefore attract anions rather than cations such as $[H^+]$. The amphoteric character which has been attributed to preparations of aluminum hydroxide is based on the fact that, in solutions having a p_H above 9, aluminum hydroxide reacts as an acid and in solutions with a p_H below 4 it reacts as an alkali.

TABLE 1.—Results of Chemical Analysis

	pH	Solids, Gm per 100 Gm.	Ash, Gm per 100 Gm.	Chlorides, Gm per 100 Gm.	Sodium Chloride, Gm per 100 Gm.	Titration (N/10 HCl per 100 Gm.)	Titration After Boiling (N/10 HCl per 100 Gm.)	Specific Gravity (25 C)	Soluble Solids, Gm. per 100 Cc.	Carbon Dioxide, Gm per 100 Gm.
Product A	6.75	5.96	4.06	0.358	0.639	1,330 cc.	468 cc.	1.042	0.446	0.5871
Product B	7.22	2.11	1.49	0.040	0.065	902 cc.	121 cc.	1.016	0.110	0.4782
Product C	7.16	4.54	3.19	0.153	0.302	1,787 cc.	369 cc.	1.036	0.464	1.2317
Product D	6.45	1.76	1.26	0.077	0.123	697 cc.	88 cc.	1.010	0.124	0.3481
Product E	6.55	5.84	3.71	0.385	0.634	2,266 cc.	314 cc.	1.043	0.840	1.540
Product F	6.54	2.58	1.83	0.035	0.059	1,137 cc.	133 cc.	1.012	0.064	0.5223
Product G	6.93	9.50	4.04	0.072	0.118	2,065 cc.	332 cc.	1.046	6.268	1.125

important of these is the presence in the solids or the ash of substances other than aluminum hydroxide and, secondly, the fact that in some of the preparations for which data are given some of the aluminum hydroxide has lost part of its acid-combining power due to aging. However, if the aluminum hydroxide is active, it will combine with approximately a theoretical amount of acid. The importance of the values for carbon dioxide content may be questioned because of difficulty in determining whether it is present in whole or in part, as dissolved gas, sodium carbonate or bicarbonate, or as part of a complex in combination with aluminum.

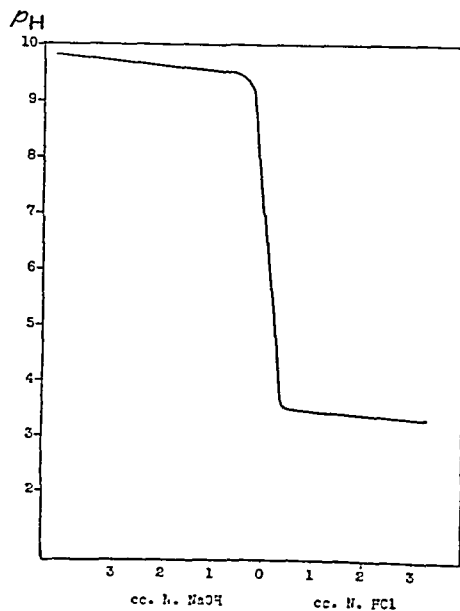
TABLE 2—Range of Values Within Which Acceptable Products Should Fall

pH	6.472
Solids	4.565 Gm per 100 Gm
Ash	3.042 Gm per 100 Gm
Chlorides (Cl-)	Below 0.5 Gm per 100 Gm
Carbon Dioxide	1.030-1.042
Acid Combining Power	1,250-2,500 Cc. N/10 HCl per 100 Gm.
	Less than 1.0 Gm per 100 Gm

From the foregoing chemical data it was possible to elaborate tentative standards based on the proposed range of values within which acceptable products should fall (table 2).

Specimens of products obtained prior to 1940 did not conform in one or more respects to these standards. In August 1941 new specimens of those products which were still available were examined. The results of this investigation are summarized in table 3. Titration curves plotted for each product confirmed the opinion of Dr. V. C. Myers that the action of aluminum

Because it never comes in contact with a p_H above 9 in the gastrointestinal tract, its acidic properties are not manifested in vivo. It is possible that the salt,



Titration curve for aluminum hydroxide.

aluminum chloride, which is formed in the stomach from the interaction of aluminum hydroxide and hydrochloric acid may react with the less acidic content of the small intestine.

The use of the term "colloidal" to describe various liquid and dry preparations of aluminum hydroxide has been questioned. The colloidal character of a preparation is based on certain physical properties, which in turn are based on the particle size of the dispersed phase distributed in the dispersing phase. This size range is usually given as 0.0001 to 0.000001 mm. A colloidal system cannot be analyzed microscopically, but the particles appear under the ultramicroscope and are not separable by filtration or centrifuging. In contradistinction to this, aluminum hydroxide preparations show few definite particles under the ultramicroscope, and a precipitate may be separated by filtration through ordinary filter paper or by centrifuging. It is possible that such a product is composed in part of a highly hydrated oxide or hydroxide. The individual particles may be of colloidal dimensions, but the attached or occluded water molecules greatly increase the effective size of these particles and give to the preparations gel-like characteristics. It is therefore felt that the term "gel" is a more descriptive term than "colloid." Dry preparations of so-called colloidal aluminum hydroxide are not accurately referred to as "colloidal" because there is no dispersing phase in this state.

535 North Dearborn Street.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
THEODORE G. KLUMPP, M.D., Secretary.

ALUMINUM HYDROXIDE PREPARATIONS

The clinical advantages of so-called colloidal aluminum hydroxide as a nonabsorbable antacid in the treatment of gastric hyperacidity and peptic ulcer were pointed out by Crohn¹ in 1929. He employed an aqueous suspension of a proprietary dry powder. Subsequent investigations have confirmed Crohn's conclusions that aluminum hydroxide shares the advantage of other neutral insoluble antacid salts in avoiding systemic alkalinization so frequently produced by the use of absorbable alkalis.

In a preliminary clinical report Einsel and Rowland² compared the neutralizing power of proprietary dry powders in water, an aqueous "colloidal cream preparation" of their own making and ordinary alkalis (sodium bicarbonate, magnesium oxide and bismuth subcarbonate) on the gastric contents of patients with peptic ulcer. By direct titration with tenth normal hydrochloric acid, the powder was found to have practically no neutralizing power, whereas the "cream" produced more prolonged neutralization in all fractions than any of the ordinary alkalis. Blood analyses revealed practically no absorption of aluminum hydroxide and no alteration of the acid base balance with large daily doses. In a further clinical and experimental study of their own gelatinous aqueous preparation of aluminum hydroxide, Einsel, Adams and Myers³ reported that free gastric acidity is lowered only until medication is discontinued and is not stimulated to secondary increase and that the efficacy of aluminum hydroxide in peptic ulcer may in part depend on its slight astringent and demulcent properties and its tendency to increase mucin secretion. They set forth the requirements of an acceptable product as follows:

"The aluminum hydroxide should be a creamy white gelatinous substance with a not unpleasant taste and cause no nausea when taken into the stomach. It must be neutral to neutral

red or phenolphthalein. It must have a combining power when titrated with Topfer's reagent, of at least 100 cc. 0.1 N HCl per 4 cc. aluminum hydroxide."

Since 1937 the Council has had under consideration several proprietary aqueous preparations of so-called colloidal aluminum hydroxide marketed under a variety of coined names and promoted with various claims by the manufacturers for use in the treatment of peptic ulcer, gastric hyperacidity, pylorospasm, gastritis, hypermotility of the gastrointestinal tract, mild stomach disorders, ulcerative colitis and diverticulitis.

Early in the course of its consideration of some of these products, a chemical consultant of the Council found that there was considerable variance in the composition and physical characteristics of certain brands. At that time the Council voted to give further consideration to these preparations when the manufacturers had submitted additional information, giving assurance as to the uniformity of their products both at the time of manufacture and for a reasonable period to cover distribution to the consumers. Based on reports which have appeared in the literature, the additional information furnished by some of the manufacturers of previously considered products and chemical studies of the American Medical Association Chemical Laboratory, the Council has recently given further consideration to these preparations of aluminum hydroxide.

PHYSIOLOGY AND PHARMACOLOGY

Prior to the publication of the first clinical reports on the use of preparations of aluminum hydroxide, Myers and his co-workers⁴ and others demonstrated that there is practically no absorption of ingested aluminum in animals. McCollum, Rask and Becker,⁵ by spectrographic methods, found none or less than 0.5 parts per million of aluminum in the liver, kidney and spleen of rats fed as much as 0.6 per cent aluminum chloride in the diet for eight months. Einsel and his associates³ included data based on ten analyses in their report to show that the amount of aluminum present in human blood averaged 0.076 mg. per hundred grams of blood and that the ingestion of aluminum hydroxide does not have an appreciable influence on the amount present.

Ivy and his co-workers⁶ also found no evidence of toxicity from ingested aluminum hydroxide in normal dogs and, employing both powder and "cream" preparations, confirmed the observations of Einsel and his associates³ that aluminum hydroxide does not disturb the acid-base balance nor stimulate a noticeable compensatory increase in acid secretion by the stomach, and that factors other than the antacid property alone probably explain its effectiveness in peptic ulcer. In their study of gastroenterostomized dogs, these investigators advanced as an explanation of the loss of weight and appetite a relative phosphorus deficiency, induced by diversion of phosphates into the feces through excessive combination with aluminum compounds. A decrease of phosphates in the urine with a corresponding increase of phosphates in the feces due to the addition of aluminum compounds to the diet had previously been demonstrated.

Fauley, Freeman, Ivy, Atkinson and Wigodsky⁷ have recently extended these studies to show that aluminum hydroxide gel in relatively large doses interferes with the absorption of phosphates in man and dog and that it may produce a phosphorus deficiency in the presence of a relative deficiency of pancreatic juice, diarrhea or a low phosphorus diet. The data indicate,

4. Myers, V. C., and Mull, J. W.: The Influence of the Administration of Aluminum on the Aluminum Content of the Tissues and on the Growth and Reproduction of Rats, *J. Biol. Chem.* **78**: 605 (Aug.) 1928. Myers, V. C., and Morrison, D. B.: The Influence of Administration of Aluminum on the Aluminum Content of the Tissues of the Dog, *ibid.* **78**: 615 (Aug.) 1928.

5. McCollum, E. V.; Rask, O. S., and Becker, J. E.: A Study of the Possible Role of Aluminum Compounds in Animal and Plant Physiology, *J. Biol. Chem.* **77**: 753 (May) 1928; Do the Spectrograms of Kahlenberg and Gless Demonstrate the Presence of Aluminum in Biological Matter? *ibid.* **85**: 779 (Jan.) 1930.

6. Ivy, A. C., Thompson, J. G., Fauley, G. B., and Bradley, W. B.: The Effect of Various Antacid Preparations on the Secretory Activity and Gastric Motility of the Dog, *Am. J. Digest. Dis. & Nutrition* **3**: 111 (1938). Attempt to Prevent Postoperative Jejunal Ulcer by Aluminum Hydroxide Therapy: An Experimental Study in Mann-Williamson Dogs, *ibid.* **5**: 792 (Feb.) 1939.

7. Fauley, G. B.; Freeman, Smith; Ivy, A. C.; Atkinson, A. J., and Wigodsky, H. S.: Aluminum Phosphate in the Therapy of Peptic Ulcer: Effect of Aluminum Hydroxide on Phosphate Absorption, *Arch. Int. Med.* **67**: 563 (March) 1941.

1. Crohn, B. B.: The Clinical Use of Colloidal Aluminum Hydroxide as a Gastric Antacid, *J. Lab. & Clin. Med.* **14**: 610 (April) 1929.
2. Einsel, I. H., and Rowland, V. C.: The Aluminum Hydroxide Treatment of Peptic Ulcer, *Ohio State M. J.* **28**: 173 (March 1) 1932.
3. Einsel, I. H.; Adams, W. L., and Myers, V. C.: Aluminum Hydroxide in the Treatment of Peptic Ulcer, *Am. J. Digest. Dis. & Nutrition* **1**: 515 (Sept.) 1934.

however, that it should not produce a phosphorus deficiency in the usual ulcer patient on the ordinary ulcer diet, which is relatively rich in phosphorus. A preparation of aluminum phosphate gel was found to be equally effective in the management of peptic ulcer, but the authors state that their results do not necessarily imply that it is superior to aluminum hydroxide for this purpose in man except under conditions already noted. The possible interference with the absorption of other minerals and the vitamins and the production of anemia with large doses of mineral salts is postulated, but this is minimized in the case of relatively inert substances such as aluminum phosphate. Interference with the absorption of iron is suggested but not conclusively demonstrated.

Quigley and his associates⁸ reported that massive doses of proprietary preparations of an "aluminum hydroxide gel" and an aluminum hydroxide powder given to normal dogs produced no influence on gastric evacuation time or histologic structure of gastric tissue and only a transient effect on the gastric secretory response of free acid to histamine phosphate. Clinical doses failed to produce significant changes in motility or tone of the stomach or pyloric antrum region.

In a report on the comparison of the various antacids, Adams⁹ indicates that aluminum hydroxide is the most suitable owing to the multiplicity of its action and its lack of toxic effects. He points out that its slight astringent and demulcent properties give it a protective action; that its "buffering" power is considerable because of adsorption of hydrochloric acid with prompt decrease in functional acidity and gradual further neutralization of acid in the stomach, followed by reprecipitation in the alkaline intestine with reabsorption of the chloride; and that it adsorbs toxins, gases and bacteria from the gastrointestinal tract.

The Komarovs¹⁰ have recently reported experimental studies on Pavlov pouch dogs given both aqueous and dry forms of a proprietary preparation of so-called colloidal aluminum hydroxide. Their observations suggest that it precipitates pepsin from gastric juice in vivo. The beneficial action observed on the peptic skin ulceration common in such experimental animals was ascribed to the "antipeptic" property of the preparation.

CLINICAL STUDIES

Since the early clinical observations of Crohn¹ and of Einsel and his associates¹¹ on the therapeutic effects of aluminum hydroxide preparations on gastric hyperacidity and peptic ulcer, additional studies of their application in these and other conditions have been reported.

PEPTIC ULCER

In 1936 Woldman and Rowland¹² reported the usefulness of the continuous intragastric drip method of administration of aqueous aluminum hydroxide in the treatment of peptic ulcer. They described the apparatus for application of the method and concluded that the method is especially suited to the management of the intractable case of ulcer before resorting to surgery. In another paper these investigators¹³ reported results of the administration of a proprietary aqueous preparation by the continuous drip method in the treatment of peptic ulcer which indicate that it is effective in producing a constant achlorhydria, prompt relief of pain, especially night pain, and practically complete disappearance of both gastric and duodenal lesions in the roentgenogram in seven to fourteen days. The authors point out that the method is entirely compatible with any type of dietetic or sedative treatment and reached the same con-

clusion as in their previous report.¹² Woldman¹⁴ has since suggested the use of a collapsible thin rubber tube to replace the Levine nasal catheter, which proved to be uncomfortable to patients receiving the continuous aluminum hydroxide drip treatment. He has also reported¹⁵ the use of this method in the treatment of 21 patients with severe gastroduodenal hemorrhage due to peptic ulcer. Complete recovery occurred in every case. The author concluded that the method offers definite advantages over other methods because a more constant decrease in acidity is maintained. This investigator¹⁶ has also suggested the use of an aqueous aluminum hydroxide preparation to suspend barium sulfate as an improved contrast medium for roentgenography of the gastrointestinal tract.

Jones¹⁷ has reported the oral use of a proprietary aqueous preparation of aluminum hydroxide in 24 patients with positive roentgen ray evidence of gastric or duodenal peptic ulcer in 23. All except 1 of the patients were completely relieved of symptoms. Of the 16 patients who had follow-up roentgenograms 13 showed disappearance of the ulcer in an average of thirty days, 1 showed improvement in eleven days and almost complete disappearance of the lesion in forty-nine days, and 1 was not improved in twelve days. This investigator¹⁸ has more recently studied the use of another similar proprietary preparation in the treatment of 43 additional patients with peptic ulcer. All were relieved of symptoms, and of 24 patients reexamined by roentgen ray, 17 showed no radiologic evidence of ulcer.

Emery and Rutherford¹⁹ have reported good results in 12 peptic ulcer patients treated with a proprietary aqueous preparation of aluminum hydroxide given orally or by a combination of oral administration and the continuous drip method. Relief of pain occurred within twenty-four hours. These investigators²⁰ have also reported the use of the same preparation in the treatment of 28 patients with severe peptic ulcer. The preparation was diluted (1 part to 3 parts of water) and administered by the method of continuous drip for one week; then orally, the same dilution was given every hour for thirteen doses daily and finally undiluted, 90 cc. three times daily before meals and at bedtime. This medication was administered in conjunction with dietary regulation. In all patients the gastric contents were completely neutralized and relief of pain was obtained within the first twenty-four hours. The authors concluded that the treatment should be recommended for patients who do not respond to the usual treatment, those with concomitant nephrolithiasis or those who develop alkalosis. More recently they²¹ have reported follow-up studies covering an average period of fifteen months' treatment, comprising 16 of the very severe cases included in their previous series of 28. In 14 of the patients thus studied, 8 were "well," 2 questionably improved and, in 4, results were unsatisfactory. They concluded that the continued use of the "gel" is believed to have avoided surgery, which might otherwise have been advised for all except 3 of the patients.

Whitcomb²² has reported the results of an eighteen months survey of 104 selected hospital patients with roentgen ray evidence of peptic ulcer. Of these patients 50 were treated with "colloidal aluminum hydroxide," 40 by oral administration and 10 by the continuous drip method, 45 with the Sippy regimen and 9 by various other medical methods. The survey revealed that the average number of hospital days for the patients treated

14. Woldman, E. E.: A Collapsible Indwelling Nasogastric Tube, *Am. J. Digest. Dis. & Nutrition* 4: 428 (Sept.) 1937.

15. Woldman, E. E.: The Treatment of Hematemesis and Melena by a Continuous Aluminum Hydroxide Drip, *Am. J. M. Sc.* 194: 333 (Sept.) 1937.

16. Woldman, E. E.: Barium Sulfate Suspension in Colloidal Aluminum Hydroxide, *Am. J. Roentgenol. & Radium Therap.* 40: 705 (Nov.) 1938.

17. Jones, C. R., Jr.: Colloidal Aluminum Hydroxide in the Treatment of Peptic Ulcer, *Am. J. Digest. Dis. & Nutrition* 4: 99 (April) 1937.

18. Jones, C. R., Jr.: Liquid Colloidal Aluminum Hydroxide in the Treatment of Peptic Ulcer, *Pennsylvania M. J.* 143: 468 (Jan.) 1940.

19. Emery, E. S., Jr., and Rutherford, R. B.: Studies on the Use of Aluminum Hydroxide Gel in the Treatment of Peptic Ulcer, *Am. J. Digest. Dis.* 5: 486 (Oct.) 1938.

20. Rutherford, R. B., and Emery, E. S., Jr.: Clinical Effect of Colloidal Aluminum Hydroxide, *New England J. Med.* 220: 407 (March 9) 1939.

21. Emery, E. S., Jr., and Rutherford, R. B.: Further Studies in the Treatment of Peptic Ulcer with Aluminum Hydroxide Gel, *New England J. Med.* 222: 205 (Feb. 8) 1940.

22. Whitcomb, B. B.: Results from Colloidal Aluminum Hydroxide in Peptic Ulcer Therapy, *J. Connecticut M. Soc.* 3: 272 (June) 1939.

8. Quigley, J. P.; Einsel, I. H., and Meschan, I.: Some Effects Produced in the Normal Stomach by the Ingestion of Moderate and Massive Quantities of Aluminum Hydroxide Gel, *J. Lab. & Clin. Med.* 24: 485 (Feb.) 1939.

9. Adams, W. L.: A Critical Evaluation of Gastric Antacids, *Arch. Int. Med.* 63: 1030 (June) 1939.

10. Komarov, S. A., and Komarov, Olga: The Precipitability of Pepsin by Colloidal Aluminum Hydroxide, *Am. J. Digest. Dis.* 7: 166 (April) 1940.

11. Einsel and Rowland,² Einsel, Adams and Myers.²

12. Woldman, E. E., and Rowland, V. C.: A New Technique for the Continuous Control of Acidity in Peptic Ulcer by the Aluminum Hydroxide Drip, *Am. J. Digest. Dis. & Nutrition* 2: 733 (Feb.) 1936.

13. Woldman, E. E., and Rowland, V. C.: Continuous Acid Adsorption by Aluminum Hydroxide Drip in the Treatment of Peptic Ulcer, *Rev. Gastroenterol.* 3: 27 (March) 1936.

with aluminum hydroxide was little more than one half required by patients on the Sippy regimen, while the percentage improved by roentgen ray was nearly twice that of the Sippy treated group. There were no recurrences in the patients treated with aluminum hydroxide, as compared to a recurrence percentage of 13.5 in the Sippy group. Failure to control symptoms during treatment occurred four times as frequently in the group on the Sippy regimen. The continuous drip method was shown to be only slightly more effective than the oral administration of aluminum hydroxide. Rapid healing, which occurred in those patients having achlorhydria, suggested that the astringent and demulcent properties of the preparation are important factors in the healing of peptic ulcers.

Kyger, Hashinger and Wilhelmy²³ have reported the results of treatment of 62 roentgen ray proved cases of gastric, duodenal and marginal peptic ulcer. The group of patients included 8 with hemorrhage and 2 in which an otherwise severe type of lesion was present. Six of these were treated with the continuous drip method. A proprietary preparation of aqueous aluminum hydroxide was used in all patients studied. All ambulatory patients were placed on a bland diet of six meals daily and received the aluminum hydroxide in doses of 4 cc. six times daily between meals. Those receiving the drip method were given from 500 to 1,000 cc. of the diluted preparation daily. Of the 58 patients who returned for follow-up study, 40 per cent showed complete radiographic healing within an average of ninety-eight and seven-tenths days; 22.5 per cent showed radiographic healing, but with deformity due to scarring, within an average period of one hundred and sixty-five days; 25 per cent showed partial radiographic healing after an average of ninety-four and five-tenths days' treatment, and 12.5 per cent showed no radiographic improvement in an average of ninety-seven and eight-tenths days. Symptomatic relief was obtained in 89.2 per cent of the entire series. Bleeding was promptly controlled in all patients with hemorrhage regardless of the method of administration.

Steigmann²⁴ has reported the results of the administration of 2,000 to 2,500 cc. every twenty-four hours of 25 per cent aqueous aluminum hydroxide (1 part to 3 parts of water) by the Woldman stomach tube (soft latex) by the continuous drip method (15 to 20 drops per minute) for a period of seven to ten days in 12 patients with large gastric ulcers. The continuous drip treatment was followed by oral administration of 2 drachms (8 cc.) undiluted every two hours for six doses daily plus diet. He found roentgen ray and subjective evidence of improvement in all cases and points out that rapid healing is diagnostic of benignity. Eads²⁵ reports the successful use of similar therapy in 40 patients with peptic ulcer (28 duodenal, 8 gastric, 4 jejunal), 31 of whom had previously received dietary-alkaline therapy without results. All but 2 patients were relieved of pain within twelve to thirty-six hours, and follow-up roentgen ray evidence indicated rapid healing in all cases. The author corroborates the previous finding of other investigators that aluminum hydroxide produces a constipating effect but indicates that liquid petrolatum or olive oil is useful to combat it.

McIntosh and Sutherland²⁶ employed a brand of aqueous aluminum hydroxide in the treatment of 38 patients with peptic ulcer, comprising 7 outpatients, 19 uncomplicated ward patients and 10 patients with gross hemorrhage. The preparation was given in doses of 2 drachms (8 cc.) six times daily at first, with frequent meals in some cases; later, as improvement occurred, two or three times daily, with three regular meals. The treatment of the lesion was successful in 34 patients and unsuccessful in 4, one of whom had gross hemorrhage. The hemorrhage was controlled in all of the patients in whom this complication was present.

Collins, Pritchett and Rossmiller²⁷ have recently reported a follow-up study of 246 cases of peptic ulcer treated with two proprietary aqueous preparations of aluminum hydroxide. With sufficient quantities of these preparations as determined by hourly aspirations during various twenty-four hour periods, it was found that the free acidity of the gastric contents can be continuously neutralized. The preparations were administered perorally and by the method of the continuous drip, together with modifications of the Sippy diet and with liquid petrolatum, magnesium oxide or aromatic fluidextract of cascara sagrada to prevent constipation. Clinical results were confirmed by roentgen examination and, in the case of gastric lesions, also by gastroscopic examination. In 154 patients with uncomplicated duodenal ulcer, satisfactory results were obtained in 97.4 per cent in a follow-up period of from two to forty-eight months. In 15 patients with massive hemorrhage followed for the same period, 80 per cent showed satisfactory results. One hundred per cent satisfactory results were obtained in 12 patients with pyloric obstruction followed for from two to thirty-six months. In 37 patients with gastric lesions followed for one to forty-one months (6 of whom showed complications), 89 per cent showed satisfactory results. In 8 patients with gastric and duodenal lesions, 75 per cent obtained satisfactory results. In 7 patients with marginal ulcer, the results were satisfactory in 71 per cent. Satisfactory results were obtained in 88 per cent of the entire series.

OTHER GASTROINTESTINAL CONDITIONS

Published reports on the use of aluminum hydroxide in conditions other than peptic ulcer are comparatively meager. Brown,²⁸ in reporting a single case of hypertrophic gastritis successfully treated on a medical regimen, suggested that, when associated with the presence of free hydrochloric acid, treatment similar to that for ordinary ulcer should be employed, and that the use of "absorbents" like kaolin, aluminum hydroxide or even silver salts may replace alkalis, which are often ineffectual. The use of aluminum hydroxide by the continuous drip method is also mentioned for the treatment of chronic gastritis by Eusterman.²⁹ Kunstler³⁰ has reported his experiences with the use of an aqueous preparation of aluminum hydroxide by gastric lavage in the treatment of hypertrophic and atrophic gastritis. The author employs a lavage consisting of 2 tablespoons of the preparation to 1 quart (liter) of warm water, which is given once or twice daily over a period of two or three weeks in conjunction with other medication and dietary regulation. The author does not state the number of patients treated and reports only two case histories in which treatment by this method was successful.

The use of mixtures of aluminum hydroxide with kaolin has been considered principally in the treatment of ulcerative colitis. Eyerly and Breuhaus³¹ reported the use of daily retention enemas consisting of a mixture of kaolin and aluminum hydroxide in warm distilled water in the treatment of 6 patients with ulcerative colitis. This was used in conjunction with other general measures. The authors expressed the belief that the treatment of ulcerative colitis by aluminum hydroxide and kaolin mixture is rational. In a further clinical study these authors³² reported good results in 84 per cent of 25 patients with ulcerative colitis treated with daily retention enemas of 3 to 5 ounces (90 to 150 cc.) of an aqueous colloidal suspension of 3 per cent pure aluminum hydroxide and 15 per cent kaolin with an equal quantity of water.

27. Collins, E. N.; Pritchett, C. P., and Rossmiller, H. R.: The Use of Aluminum Hydroxide in the Treatment of Peptic Ulcer, *J. A. M. A.* **116**: 109 (Jan. 11) 1941.

28. Brown, A. E.: Chronic Ulcerative Gastritis: Report of a Case with Successful Termination on a Medical Regimen, *Proc. Staff Meet., Mayo Clin.* **12**: 161 (March 17) 1937.

29. Eusterman, G. B.: Chronic Gastritis: Its Place in Modern Medical Practice, *M. Clin. North America* **23**: 857 (July) 1939.

30. Kunstler, M. B.: Gastritis: Its Treatment with Colloidal Cream of Aluminum Hydroxide Lavage, *M. Rec.* **149**: 268 (April 19) 1939.

31. Eyerly, J. B., and Breuhaus, H. D.: Treatment of Ulcerative Colitis with Aluminum Hydroxide and Kaolin, *J. A. M. A.* **109**: 191 (July 17) 1937.

32. Eyerly, J. B., and Breuhaus, H. D.: Further Studies in Treatment of Ulcerative Colitis with Aluminum Hydroxide and Kaolin, *Illinois M. J.* **74**: 534 (Dec.) 1938.

23. Kyger, E. R., Jr.; Hashinger, E. H., and Wilhelmy, E. W.: Treatment of Peptic Ulcer with Colloidal Aluminum Hydroxide, *Am. J. Digest. Dis.* **6**: 363 (Aug.) 1939.

24. Steigmann, Frederick: Colloidal Aluminum Hydroxide "Continuous Drip" in the Treatment of Large Gastric Ulcers: The Therapeutic and Diagnostic Value of This Method, *Illinois M. J.* **76**: 443 (Nov.) 1939.

25. Eads, J. T.: Clinical Results from the Continuous Intragastric Drip, *Am. J. Digest. Dis. & Nutrition* **7**: 32 (Jan.) 1940.

26. McIntosh, J. F., and Sutherland, C. G.: The Use of Colloidal Aluminum Hydroxide in the Treatment of Peptic Ulcer, *Canad. M. A. J.* **42**: 140 (Feb.) 1940.

SUMMARY

After consideration of the published clinical reports on the use of aluminum hydroxide, the Council decided that there is sufficient controlled evidence to warrant recognition of the usefulness of the aqueous preparations as gastric antacids by either oral or the continuous intragastric drip method of administration in the treatment of peptic ulcer and symptomatic gastric hyperacidity only. Reports indicate that by either method of administration the aqueous aluminum hydroxide preparations induce prompt relief of pain in most cases of peptic ulcer, are useful in the treatment of hemorrhage from such lesions and adequately control hyperacidity. In some instances, however, the studies reported are not well controlled or well followed, and it should be kept in mind that the spontaneous remissions which characterize the peptic ulcer syndrome introduce difficulty in the evaluation of any specific type of treatment in this condition. Furthermore, the variance in composition of some of the commercial preparations introduces difficulty in accurate comparison of studies in which different products were employed.

Manufacturers' claims for the use of aluminum hydroxide preparations in the treatment of pylorospasm, hypermotility and postoperative conditions of the gastrointestinal tract, gastritis and mild stomach disorders, unless definitely associated with peptic ulcer or gastric hyperacidity, are not permissible on the basis of the published clinical evidence available at the present time. Claims for the rectal and/or oral use of aluminum hydroxide alone or mixed with kaolin in the treatment of colitis, diverticulitis and other gastrointestinal conditions are not permissible until there is more clinical evidence to support the use of aluminum hydroxide preparations alone in these conditions and adequate evidence to establish the rationale for mixing them with the similar compound kaolin. Claims that the preparations are not constipating are disallowed, but evidence indicates that this effect may be safely controlled by the oral administration of a suitable intestinal lubricant. Their use with barium sulfate for gastrointestinal roentgenography appears objectionable from this standpoint because of the additional constipating effect of this compound.

Claims that the aluminum hydroxide preparations adsorb acid or other substances such as bacteria, toxins and gases lack adequate evidence to support them. While it appears probable that aluminum hydroxide possesses adsorptive properties in common with certain other neutral insoluble salts, such claims are of no significance unless there is evidence to indicate that the presence of these substances is of definite pathologic importance in peptic ulcer or other conditions in which the use of the preparations has been proposed. The Council found no objection to the use of such descriptive terms as "amphoteric," "nonabsorbable," "nonirritating," "mildly astringent" and "demulcent." While the clinical importance of the "amphoteric" property appears somewhat doubtful, it is believed the mild astringent and demulcent properties are of significance in the effect of these preparations on ulcerative lesions of the upper gastrointestinal tract. The mucin stimulating and pepsin precipitating properties of the preparations which have been reported may also be of significance in the activity of the preparations on such lesions.

Irrespective of the various properties of aluminum hydroxide preparations which may be favorable to the healing of peptic ulcer, however, it is emphasized that they should be regarded primarily as antacids and as such are useful principally in those conditions in which it is desired to control hyperacidity. There is evidence to indicate that they do not stimulate a marked secondary rise in free hydrochloric acid or produce alkalosis as in the case of the absorbable alkalis. Although there is some evidence to indicate that the aluminum hydroxide preparations may not be without certain undesirable effects such as interference with the absorption of phosphates or other minerals and possibly vitamins, these do not appear to be of sufficient importance to militate against their usefulness in certain conditions. The preponderance of evidence accumulated to date favored the view that the preparations as now employed do not

produce serious deleterious effects. It has been shown that the absorption of aluminum compounds from the gastrointestinal tract is not appreciable. Orally administered preparations of this nature therefore exert principally local effects on the gastrointestinal tract and its contents. At the present time there is inadequate clinical evidence to warrant recognition of the use of the tablet or other dry preparations of aluminum hydroxide.

The results of chemical studies conducted by the Council's consultant and the A. M. A. Chemical Laboratory invalidate the claim that the neutralization of hydrochloric acid by aluminum hydroxide occurs partly from adsorption, since neutralization is completely explained on the basis of simple chemical reaction. The laboratory analyses of the aqueous preparations also indicate the presence of sodium chloride and sodium carbonate as impurities, but these are not objectionable from the purely clinical standpoint of chloride and carbon dioxide content, if the amounts are less than 1 per cent. The presence of a small amount of oil of peppermint, oil of wintergreen, saccharin or other substances as flavoring agents to improve taste or the addition of sodium benzoate or other substance as a preservative is probably not undesirable and, in the case of the latter, may be necessary because the preparations cannot be heated without affecting the acid combining power of the products. Commercial preparations of aluminum hydroxide should be labeled to show the calculated percentage of $\text{Al}(\text{OH})_3$ which is present and the amount of the product which will combine with a given volume of hydrochloric acid. Laboratory findings indicate that the products should contain from 4 to 6 per cent of $\text{Al}(\text{OH})_3$ (calculated from Al_2O_3) to maintain a fairly uniform suspension. The products examined were found to vary in consistency and the tendency of the solid portion to settle out. From a purely practical standpoint, the tendency to separate on standing does not interfere with uniform dosage because the preparation is easily resuspended on shaking. The A. M. A. Chemical Laboratory has set up tentative chemical standards in order to insure a fair degree of uniformity of composition in proprietary preparations which is essential to the attainment of consistent therapeutic results. The question of an accurately descriptive nonproprietary name for such preparations is now under consideration and has been referred to the Council's Committee on Nomenclature. The main difficulty arises in connection with the physical properties of the liquid products, which are not in certain respects accurately described by the term "colloidal." In the meantime the results of further chemical analyses are expected to enable the Council to accept those products which meet the required standards for inclusion in N. N. R. under a suitable name.

CONCLUSION

The Council voted to accept liquid preparations of aluminum hydroxide on the market which have been submitted, provided that these are found to be satisfactory after further examination by the A. M. A. Chemical Laboratory, that labels and advertising are revised in accordance with its stipulations and recognized uses, and that the manufacturers agree to abide by the decision of its Committee on Nomenclature in the choice of the proprietary and nonproprietary names, and further voted to inform the concerns that dry forms of aluminum hydroxide will not be recognized until there is sufficient laboratory and clinical evidence to establish their activity and usefulness as gastric antacids.

[Since the adoption of the foregoing preliminary report, the Council has further voted to adopt the name Aluminum Hydroxide Gel as the most accurately descriptive nonproprietary designation for acceptable preparations of aqueous aluminum hydroxide and, by virtue of the priority right of the Alba Pharmaceutical Company, Inc., New York, through its acquisition of Creamalin from the Cleveland Chemical Associates, as the first manufacturer to make an aqueous product commercially available to physicians, to recognize the proprietary name Creamalin for this brand of aluminum hydroxide gel, on the basis that it represents a contraction of the name cream of aluminum hydroxide. Secretary of the Council.]

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SATURDAY, OCTOBER 18, 1941

REHABILITATION OF THE DRAFTEES

At his press conference on October 10 the President of the United States indicated a plan for rehabilitation of the draftees who are classified at the time of their first physical examination as being susceptible of rehabilitation at a reasonable cost in a comparatively short time. Estimates publicly announced by different agencies have indicated that the number susceptible of rehabilitation varied from 20 to 50 per cent of those rejected as unfit. As indicated in the item published under the heading of Medical Preparedness in the current issue of THE JOURNAL, the President apparently accepted the more scientific estimates submitted to him; he indicated that approximately 200,000 men would be susceptible of rehabilitation for military service.

No doubt the large majority of those susceptible of rehabilitation represent draftees whose difficulties are concerned with the teeth. Thus much of the burden of rehabilitation will fall on the dental profession. Apparently representatives of the press who interviewed the President were doubtful about the possibility that draftees would volunteer for rehabilitation or that they could under some type of legal ruling be compelled to undergo necessary rehabilitation. The President, however, seems to have had legal opinions as to how such rehabilitation might be compelled, once the draftee came under the control of his Selective Service board.

Under the heading of Medical Preparedness, also in this issue, appears an announcement indicating that there is a plan to dismiss the physical examination heretofore conducted by the medical representative of the Selective Service board and to place the full responsibility for the physical examination on Army medical boards. Presumably the medical members of the local Selective Service board will continue to act as members of the boards, making only such rulings as may be made without physical examination. No doubt new regulations will be developed to cover the limitations placed on the decisions of the medical members of the local Selective Service boards.

Obviously the first medical phases of Selective Service have been largely experimental. The new technics,

involving both new methods for physical examination and the program for rehabilitation, will probably also be experimental until sufficient evidence has accumulated to develop a wholly effective process.

DEFERMENT OF MEDICAL STUDENTS, INTERNS AND RESIDENTS

When it became apparent in June 1940 that the medical profession would be required to provide the Army, the Navy and the Public Health Service with a considerable number of physicians to meet the needs of the preparedness campaign, medical leaders with foresight urged the deferment of medical students and interns who might be called up under the Selective Service Act. Almost every agency connected with medical education took an interest in the problem. Eventually, as has been previously published in THE JOURNAL, arrangements were made to defer medical students and interns. Moreover, opportunity was provided for official enrolment of junior and senior students in the War Department Reserve Pool, thus permitting them to continue their education and making them available for military service as medical officers after their medical education and internship had been completed. Unfortunately, a relatively small percentage of the medical students in the junior and senior years have accepted appointment to the Medical Administrative Corps, which would make them available in the War Department's Reserve Pool. As a result, a situation impends which is giving the Offices of the Surgeon Generals of the Army and Navy great concern. Obviously, they must plan for a continuous supply of medical officers for at least the five year program contemplated by the Selective Service Act.

If the young men who are attending the medical colleges at this time persist in avoiding military service, the Army will not have the medical personnel that is required. The folly of the medical students who have failed to avail themselves of the opportunity offered to them is so obvious as to cause wonderment. At any time, under the Selective Service Act, deferment could be discontinued. If the needs of the Army demand such discontinuance, every medical graduate could be called at the moment he graduates or before. The present situation in which medical students are permitted to have continuity of medical education and internship before being called into military service was achieved only with immense effort and by favorable consideration on the part of representatives of the Army, the Navy, the Public Health Service, the Health and Medical Committee, the Committee on Medical Preparedness, the Association of American Medical Colleges and innumerable other agencies working with the National Selective Service. The representatives of the National Selective Service, including the director and his medical advisory staff, have had utmost sympathy with the importance of deferment of medical

students so as to provide continuity of medical education. So far as we can learn, not more than four or five students in good standing in medical schools of repute in this country have been inducted into the military service.

Now the failure of the student to cooperate as he should may bring about a situation in which all of the planning will be put to naught. Failure of students to apply for commissions as second lieutenants in the Medical Administrative Corps or as ensigns in the Navy may place on the deans of medical schools the responsibility for their actions, so that deans will be compelled to discontinue recommendations for deferment for junior and senior students. Moreover, interns and residents constitute the pool from which the Army must expect to draw replacements for medical officers in the next two years. If these groups do not come into the reserve corps, medical reserve officers now in the Army will be held for prolonged service. Here a responsibility rests on superintendents of hospitals. Deferment of residents or interns beyond one year should not be requested unless the physician concerned cannot be replaced and unless his withdrawal would be a serious handicap to the service of the institution.

An appeal to the patriotism of the medical student should in itself be sufficient to cause promptly a favorable response. Always it has been the proud boast of the medical profession in the United States that it was never found lacking when the nation called. In every conflict in which our nation has been engaged, thousands of physicians have rushed to be among the first to give of their services. The preparedness of the nation is vital to its future safety. The threat that a display of lack of patriotism will result in prompt action by the government in discontinuing deferment should make even the unpatriotic see the logic of offering the fullest possible cooperation by enrolment in the War Department's Reserve Pool at this time.

NEW DEVELOPMENTS IN KNOWLEDGE OF ENCEPHALITIS

The largest encephalitis epidemic of record has just ended. According to a recent report by Leake,¹ there were 1,080 cases and 96 deaths in North Dakota, 815 cases in Minnesota, 180 cases in South Dakota, 64 cases in Montana, 250 cases in Nebraska and 434 cases in Manitoba. The highest incidence was 167 per hundred thousand in North Dakota and the highest fatality rate was 16 per cent in Nebraska. Symptoms of this epidemic have been similar to those described for the St. Louis type of infectious encephalitis and for those described by Hammon² for the encephalitis in the Yakima Valley. Mosquitoes have been potentially incriminated as the vectors. Leake points out that there is likely to be a reservoir or reservoirs other

than man or horses if mosquitoes are responsible for transmission. In a preliminary report on this subject, Cox, Jellison and Hughes³ of the United States Public Health Service report the isolation of Western equine encephalomyelitis virus from both brain and spleen of a prairie chicken shot in the field. This bird was shot in the vicinity of an area in which many human cases of encephalitis were occurring. This is apparently the first time that this virus has been reported in a host other than man and horses coincidental with a human epidemic in time and place.

The problems of infectious encephalitis in this country may well dovetail with studies reported or under way in distant lands.⁴ Seasonal encephalitis was presumably a common disease in czarist Russia. Unequivocal epidemiologic and clinical evidence of its existence was reported by Pervushin over forty years ago with numerous well authenticated outbreaks in the Urals and Siberia during the last twenty-five years. The disease is distinctly seasonal in character, 80 per cent of the cases occurring during May and June, with a 30 per cent fatality rate. The epidemics appear to have been strictly localized and confined for the most part to solitary hamlets situated in valleys covered with thick forests. The majority of the cases occur in actual forest workers; hence the usual Russian expression "forest-spring encephalitis." The disease affects mainly adult men; elderly men, women and young children rarely contract it. Investigations by Moscow biologists and clinicians has led to the belief that the disease was not spread by contact but by blood-sucking insects. Seventy-five per cent of the patients gave a definite history of having been bitten by ticks from eight to eighteen days before the development of symptoms, at which time the patients lived, worked or marched in forests abundantly infested with pasture ticks. The quantitative distribution of clinical cases was closely correlated with the territorial distribution of one species of these ticks. Repeated subinfectious doses of the causative agent might well account for the gradual acquired immunity of regional populations, accompanied by an increased specific virucidal power of the blood. Regional surveys showed virucidal antibodies in the blood of many people in endemic foci as well as in the bloods of many wild and domestic animals (horses, cows, rodents). Human and animal bloods were negative in nonendemic regions.

The suggestive evidence that "forest-spring encephalitis" is a tick-borne infection was confirmed by experimental work in the Moscow Institute. In the bodies of pasture ticks collected in endemic foci it was possible quite regularly to detect the encephalitis virus by cerebral inoculation of white mice. Negative results were obtained with control ticks collected in encephalitis-free localities. The mouse disease was identical in all

1. Leake, J. P.: Epidemic of Infectious Encephalitis, *Pub Health Rep.* 56: 1902 (Sept. 26) 1941.

2. Hammon, W. M.; Gray, J. A.; Evans, F. C.; Izumi, E. M., and Lundy, H. W.: *Science* 94: 305 (Sept. 26) 1941

3. Cox, H. R.; Jellison, W. L., and Hughes, L. E.: Isolation of Western Equine Encephalomyelitis Virus from a Naturally Infected Prairie Chicken, *Pub. Health Rep.* 56: 1905 (Sept. 26) 1941

4. Smorodintseff, A. A.: *Arch. f. Ges. Virusforsch.* 1: 468, 1940.

particulars with the disease produced by parallel inoculations with human encephalitis brain emulsions.⁵ When ticks collected in encephalitis foci were allowed to suck the blood of healthy mice, the mice usually acquired encephalitis. The virus not only multiplies in the body of infected ticks but is localized in large measure in the salivary glands.⁶ Ticks are also able to transmit the virus through the ovaries (or ova). Larvae hatched in the laboratory and originating from individuals collected in an encephalitis foci are often infectious for mice. In one test, for example, 6 out of 22 groups of endemic larvae proved infectious for white mice.⁷ The virus apparently hibernates in the body of ticks during the winter season. Sexually mature ticks collected in the early spring are as frequently infected as ticks collected at the climax of the subsequent epidemic.

A second natural reservoir of the virus is offered by wild animals, particularly rodents. Encephalitis virus is frequently demonstrable in the brain and blood of mammals and birds caught in encephalitis foci.⁸ Spring-summer encephalitis, therefore, is apparently not a primary human disease but a disease primarily of wild mammals and birds. Human beings rarely disseminate the virus, since patients are usually isolated in hospitals, where further contact with ticks is prevented.

The "forest-spring" encephalitis virus differs from the St. Louis encephalitis virus in its antigenic and immunogenic properties, since the two viruses do not give cross neutralization or cross immunity reaction. A closer relationship exists between the Russian virus and Japanese summer encephalitis. A monovalent Japanese virus anti-rabbit serum will only partially neutralize the Russian virus while fully neutralizing the Japanese strain. Russian virus anti-rabbit serum will fully neutralize both strains. The Japanese virus is thus apparently deficient in some fractional antigen present in the Russian infection.

Aside from statistically successful methods of rodent and tick control, encouraging results have been reported by the Moscow investigators from prophylactic immunization of populations in areas of endemic foci. A 1 per cent brain emulsion of infected mice is devitalized by two weeks' storage at 2 to 5 C. in solution of formaldehyde U. S. P. diluted 1:750. Preliminary tests on volunteers showed that this nonviable vaccine does not cause local or constitutional reactions and that two subcutaneous doses cause a distinct increase in the specific virucidal properties of the blood. The practical value of the formaldehyde-treated vaccine was subsequently tested in several endemic foci, vaccination being completed in the late winter months prior to the expected

seasonal outbreak. Among 1,527 vaccinated subjects in one focus, for example, only 2 contracted mild encephalitis, while among the 2,942 nonvaccinated controls 44 cases with 11 fatalities were recorded. Summarizing the results, they conclude that two doses of the vaccine reduces morbidity to one tenth and mortality by at least two thirds, a total reduction in the seasonal mortality to about 3 per cent of that in control areas. Encouraging results are also reported by the Moscow clinicians from the use of human convalescent or hyperimmune animal serum. A critical drop in temperature and marked improvement in symptoms are produced by convalescent human serum if administered in relatively large doses by the combined "endolumbal" (10 cc.) and intramuscular (40 cc.) routes. Such serum, however, is effective only during the early stages of the disease, injections after the second day being relatively ineffective.

A similar epidemiologic survey is now in progress in certain endemic foci of the Pacific Northwest. Annual epidemics of both St. Louis encephalitis and Western equine encephalitis, for example, have occurred in both man and horses in the Yakima Valley, Washington. In their preliminary survey of this region Hammon and his co-workers found specific virucidal antibodies against one or both of these viruses in the bloods of about 50 per cent of the domestic birds (chicken, duck, goose, owl, pigeon and turkey). About 20 per cent of the local wild birds (quail, robin, sparrow, dove, flicker, hawk) gave similar reactions. Specific antibodies were also demonstrable in about 50 per cent of the regional domestic mammals (horse, cow, sheep, goat, pig, dog), the only mammal giving consistently negative results being the domestic cat. Wild mammals of the region (rabbit, rat, mouse, squirrel) gave positive tests in only about 8 per cent of the cases.

If one assumes that these specific antibodies can result only from previous infection with homologous virus, the survey indicates a much more widespread potential reserve for both viruses than was generally suspected before publication of the Moscow investigations. The California-Washington research group concludes: "It would appear that barnyards and fowl runs, found in large numbers in small towns, rural and suburban areas, are the principal foci of infection for encephalitis of either the Western equine or the St. Louis type."

A second research group under Hammon's direction⁹ now reports the successful isolation of both viruses from mosquitoes caught in the Yakima Valley. Over 9,000 mosquitoes, biting flies and miscellaneous arthropods were caught in light traps in the stables and farm yards of that region. Pooled samples of from 5 to 150 specimens of each insect species were ground and extracted with 30 per cent sheep serum. Each extract was tested by intracerebral inoculation into a group of 5 Swiss mice. The only samples that proved infective

5. Rijov, N. V., and Skrynnik, A. N.: Report of the All-Union Congress of Microbiology, Jan. 25-31, 1939.

6. Pavlovsky, E. N.: Report of the All-Union Congress of Microbiology, Jan. 25-31, 1939.

7. Shubladse, A. K., and Serdiukova, G. V.: Arch. Soc. biol. 56, number 2, 1939.

8. Soloviev, V. D.: Arch. Soc. biol. 56, number 2, 1939.

9. Hammon, W. M.; Reeves, W. C. Brookman, B.; Izumi, E. M., and Gjullin, C. M.: Science 94: 328 (Oct. 3) 1941.

for mice were extracts from one species of mosquito (*Culex tarsalis*). From one pool of 66 *Culex* mosquitoes the St. Louis virus was isolated and fully identified by neutralization tests. From a second *Culex* pool the Western equine virus was recovered and fully identified. Two other viruses have been isolated from other *Culex* emulsions but have not yet been identified.

Culex tarsalis, the commonest mosquito in the Yakima Valley, is widely distributed in Western states. Its larvae are found in permanent ponds, irrigation seepage, barnyard drainage and sewage. Adults may be collected in large numbers by means of light traps in shelters such as barns or houses. In temperate regions adult females hibernate in sheltered places, emerging in the spring to begin egg laying. This species of mosquito has been observed to feed indiscriminately on man, horses, mules, cows, ducks and other domestic fowls.

These observations confirm the conclusion of the Russian investigators that the main method of spread of seasonal encephalitis is through the agency of blood-sucking insects.

Current Comment

CAMPAIGN AGAINST ACCIDENTS

Recently the President of the United States issued a proclamation calling on the National Safety Council and on every citizen to engage wholeheartedly in a campaign to reduce accidents. A presentation of industrial injury statistics by the Bureau of Labor Statistics of the U. S. Department of Labor¹ lends particular point to this campaign. Figures covering 29,442 cooperating establishments are tabulated, employing nearly 5,000,000 wage earners, who worked 9,744 million hours. Manufacturing establishments showed a slight increase in the frequency of accident occurrence from 14.9 to 15.3 per million man hours. In three defense industries which have expanded enormously during the past year—machine tools, aircraft production and shipbuilding—the number of disabling injuries per million hours worked increased by 22 per cent. The manufacture of explosives continues to be perhaps the most dangerous occupation; a 32 per cent increase in hours worked was accompanied by a 297 per cent increase in the number of disabling injuries. Other industries have had similar but less wide excursions of accident incidence. All these figures are simply a re-expression of past experience—that industrial injury rates follow more or less closely the curves of employment and business activity. Certainly, safety precautions in industry should not be relaxed, particularly in the present tremendous race for production. Physicians associated with industry have an especially valuable contribution to make in the control of preventable disability among workers. They should employ every opportunity by education and precept to see that the Presidential admonition is heeded.

1. Kosoris, Max D., and Kjaer, Sven. Industrial Injuries in the United States During 1940, Monthly Labor Review, U. S. Dept. of Labor, Bureau of Labor Statistics, August 1941, vol. 53, number 2

SAMPLE RACKETEERS: II

"Selling Samples" was the title of a Current Comment (*THE JOURNAL*, Nov. 21, 1936) in which attention was called to the fact that some persons were making a business of buying samples submitted to physicians by pharmaceutical manufacturers. Again the subject was discussed in *THE JOURNAL*, Jan. 25, 1941, calling attention to a letter addressed to a physician suggesting that he write to a dozen different manufacturers, asking them for samples to be used by his family. It was stated that the presumption was that the writer would soon call on the physician and offer to purchase the preparations. This comment closed with the statement "Any physician who would cooperate in a performance of this type is participating in a distinctly unethical procedure and is lending himself to what is essentially a fraud." Now comes evidence to suggest that some of those who engage in practices of this kind no longer ask physicians to write for the samples but actually write requests themselves; presumably the physician will later be called on and requested to sell his samples. As many as fifty requests for a single preparation, all in the same handwriting but signed with the names and addresses of various physicians in greater New York, have been received by one manufacturer. Apparently these cards constitute in each instance a forgery of the physician's name. When consideration is given to the fact that there are three sets of such requests for one product of one manufacturer, it is not difficult to contemplate the infinite possibilities of acquiring wholesale quantities of most drugs without cost—a profitable, if not nice, business! Any physician who allows himself to become associated with such a racket cannot be too severely condemned. The remedy for this particular phase of the sample "pick-up" racket is simple. Firms should require such requests on the stationery of the physician, and signed in his own handwriting. The firms will have done their part, and, if the physician does his, the sample racketeers will have to find other fields of endeavor for their nefarious activities.

HEART RECORDS AND THE TEACHING OF CARDIOLOGY

From the studios of the Columbia Recording Corporation, makers of Columbia records, comes a series of seven records¹ to aid students of medicine and physicians in studying the sounds of the heart as heard through the stethoscope. The reproductions on the first six records are explained by the spoken voice of Dr. George D. Geckeler, who no doubt conceived the technic. First come the sounds of the normal heart, then a variety of murmurs, arrhythmias and other variations as they would actually be heard by the use of the stethoscope over the chest wall. Indeed, the user is instructed to listen to the records with his stethoscope. The seventh record does not have the spoken voice, but the bands are longer for easier identification. This record serves as a test of ability to recognize the sounds heard previously. Thus the technics of modern invention and mechanics are again adapted to the advancement of medical education and medical science.

1 This album will be M600 of the Columbia Recording Corporation, Bridgeport, Conn., the sale price is \$12.75

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

ONE PHYSICAL EXAMINATION FOR REGISTRANTS

A single physical examination for Selective Service registrants, in lieu of the present dual examinations conducted by local board physicians and Army induction stations, will be the procedure followed throughout the country by Jan. 1, 1942, National Headquarters, Selective Service System, has announced. A major advantage, National Headquarters said, is that registrants will know, almost for a certainty, that if they pass physical examination under the new system they will be inducted into the armed forces. The new program also will relieve in part the burden on thousands of private practitioners who have been conducting the examinations of registrants at local boards and who have been serving on a voluntary basis, it was asserted. War Department action will make possible the one examination system throughout the nation, Selective Service Headquarters said.

The plan for the single examination provides that each state be divided into districts, with the Army physicians conducting examinations of selectees in each of the districts. In the more congested areas an examination station will function at all times, while in the sparsely settled districts the tests will be given at periodic intervals. Also, it was asserted, the period between the time of examination and the time of induction will give registrants ample opportunity to make final arrangements in their financial and other personal affairs. It was pointed out that, whenever possible, registrants will be permitted to return to their homes on the same day they are examined by Army physicians.

While the examinations by Selective Service physicians will be eliminated for the most part, National Headquarters said, it is expected that in certain areas Selective Service doctors will conduct "screening examinations" to eliminate men obviously unfit for military training. While the single examination plan probably will not be in operation throughout the nation until January 1, commanders of the Army corps areas are working with the state Selective Service directors at the present time to make the program effective generally as rapidly as possible.

PLANS FOR REHABILITATION OF REJECTED DRAFTEES

In his press conference, October 10, President Roosevelt criticized the nation for permitting conditions which have left 50 per cent of its youth unfit mentally or physically for Army service and inaugurated a program to "salvage" 200,000 of the 1,000,000 youths who have been rejected.

Under the salvage program the federal government will pay medical costs for treatment by local physicians of approximately 200,000 registrants whom local draft boards certify as susceptible of rehabilitation for army service. The Army expects to accept virtually all of these 200,000 after they undergo treatment by family physicians or dentists at federal expense, Mr. Roosevelt said.

Describing the salvage program as only the initial objective, Mr. Roosevelt said that existence of conditions which permit so high a ratio of rejections is an indictment of America. He said he would launch a long-range program calling for cooperation of states, counties, cities, townships and individuals to remedy the conditions which are the underlying cause of the bad situation. He released statistics collected by Selective Service Headquarters showing that approximately 1,000,000 men have been disqualified for Army service because of physical, mental or educational conditions. This represents approximately 50 per

cent of the total number of men examined. Mr. Roosevelt made it clear that he feared this ratio among men of draft age represented a fair index of the health conditions of all Americans.

The President read from a report presented by Brig. Gen. Lewis B. Hershey, Selective Service director, which declared that of the 1,000,000 rejected "about 200,000 can be completely rehabilitated and made available for general service in our armed forces. The remainder can be rehabilitated to perform only limited service or, because of mental, nervous, cardiovascular and pulmonary diseases and musculoskeletal defects are incapable of rehabilitation or even limited service and are therefore not being considered under the present rehabilitation program for Selective Service registrants," Hershey's report said.

"Our initial objective in this rehabilitation program will be the 200,000 registrants who can be completely rehabilitated and made available for general military service in the armed forces at a small cost and in a reasonably short time.

"Certain types of venereal diseases, operable hernias, deficiencies in vision and teeth, and other minor defects will be corrected in cases where the Army determines that the registrant will then be acceptable for general military service.

"The registrant will have the privilege of having the services performed by his family physician or dentist in his own community.

"The cost of this rehabilitation program will be borne by the federal government as a necessary part of our national defense program, and additional funds will be made available to the Selective Service System for this purpose."

Mr. Roosevelt was asked by what authority registrants could be compelled to undergo medical or dental treatment to prepare themselves physically for military service. He replied that when a registrant appears before an examining board he is under the jurisdiction of that board and can be directed to undergo such treatment. Conjecturing that a majority of such persons would be willing and eager to receive free treatment, Mr. Roosevelt said that in cases of recalcitrancy the registrant could be inducted into the Army, placed under Army orders and commanded to undergo treatment. The President disclosed that the Army also had presented an alternative program, which he rejected, calling for induction of all rehabilitable cases and their treatment in Army medical centers.

When costs of housing, food, clothing, Army pay and medical care in this program were considered, Mr. Roosevelt said it would involve expenditure of approximately \$500,000,000. The salvage program by local physicians and dentists which he has approved will cost far less than that, he said.

The President disclosed that plans already are well advanced for the salvage program. In cases of heart and musculoskeletal diseases, as well as mental and nervous cases, persons considered by local boards as being susceptible to rehabilitation will be placed in a special selective service category. Remaining under orders of their selection boards, these men will be visited by traveling boards or "teams" of prominent specialists, who will examine them and recommend curable cases for immediate treatment at government cost.

The selective service report itemized as causes for rejection:

Dental defects, 188,000 cases, 20.9 per cent.
Defective eyes, 123,000 cases, 13.7 per cent.
Cardiovascular diseases, 96,000 cases, 10.6 per cent.
Musculoskeletal defects, 61,000 cases, 6.8 per cent.
Venereal diseases, 57,000 cases, 6.3 per cent.
Mental and nervous diseases, 57,000 cases, 6.3 per cent.
Hernia, 56,000 cases, 6.2 per cent.
Defects of ears, 41,000 cases, 4.6 per cent.
Defects of feet, 36,000 cases, 4.0 per cent.
Defective lungs, including tuberculosis, 26,000 cases, 2.9 per cent.
Miscellaneous, 159,000 cases, 17.7 per cent.

The President said that in the cases of dental defects, hernias, eye trouble and even cardiac and musculoskeletal defects the ratio of cures is expected to be relatively high. Venereal cases are especially susceptible of salvage, he said, and venereal infected registrants will be kept under the orders of selection boards and instructed to get themselves cured quickly and report back for service. The salvage program, Mr. Roosevelt admitted, leaves for future consideration the larger question of why half of American youths are physically and mentally defective and why 100,000 had to be rejected because of a lack of a fourth grade education.

Col. Leonard G. Rowntree, chief of the Selective Service Medical Division, after a conference with the President said that the preliminary figures point to the inescapable conclusion that there is an urgent need for a national campaign for improvement of general health.

MEDICAL OFFICERS SELECTED TO BE REAR ADMIRALS

President Roosevelt last week approved the recommendations of the Navy Medical Corps Selection Board, which selected three captains for advancement to the rank of rear admiral. The selection board, which convened at the Navy Department on September 15, recommended Capts. Edward C. White, Edgar L. Woods and James M. Minter for advancement to the grade of rear admiral.

Captain White was first appointed as Assistant Surgeon in the Navy in 1905. He holds the Cuban Pacification Medal, the Victory Medal with West Indies Clasp, and the Second Nicaraguan Campaign Medal.

Captain Woods was commissioned an Assistant Surgeon in the Navy in 1905 and served with various Navy units, his service including tours as Medical Officer in Command of the Naval Dispensary, Navy Department, and a tour of service in command of the Naval Hospital, Washington, D. C. Captain Woods has been awarded the Dominican Campaign Medal and the Victory Medal.

Captain Minter was first appointed as an Assistant Surgeon in the Medical Corps of the Navy in 1906. He was made a captain on June 2, 1927 and holds the Victory Medal and the Navy Expeditionary Medal.

IMMEDIATE ERECTION OF UNITED SER- VICE ORGANIZATION RECREA- TION BUILDINGS

Following a recent Presidential order transferring the erection of United Service Organization buildings at military camps from the Federal Works Administration to the Quartermaster Corps, the Quartermaster General announced October 3 that the immediate construction of the first group of twenty-five recreational buildings for the United Service Organization had been ordered. The War Department has received from the Federal Works Administration a list of fifty-one locations for recreational buildings approved by the President. Actual building will be started as soon as titles have been acquired to the sites, which in all cases will be donated by the respective communities. The total number of buildings to be constructed in the United Service Organization program is in excess of two hundred and fifty. The structures are intended to afford recreational and sports facilities adjacent to the training camps, particularly near military reservations located in more or less isolated sections.

PREFERENCE RATING FOR RESEARCH MATERIALS

There has been some misunderstanding among research laboratories as to the proper method of applying for the A-2 preference rating assigned to deliveries of materials and equipment to them, in Preference Rating Order P-43. All applications should be filed on PD-88 and directed to the Chemical Branch, Office of Production Management, Washington, D. C. The fact that the National Academy of Sciences is being asked by the Priorities Division to pass on certain applications does not mean that any requests should be addressed directly to the academy by laboratories interested in the plan. All correspondence should be with the OPM Chemical Branch.

NEW EMERGENCY FIELD RATION

A hike across the desert sands of New Mexico has just been completed by a small experimental expedition from Wright Field, Dayton, Ohio, for the purpose of testing a new type of emergency field ration produced by the Quartermaster Subsistence Research Laboratory at Chicago.

Designed for emergency use by Air Corps personnel who might be forced down at points where a 100 mile hike is necessary to reach a settlement, the new ration is packed in three containers with an average weight of 12½ ounces a meal.

The mainstay of the ration is a "pemmican" biscuit containing virtually all the essentials for a balanced diet. Each meal package also contains two graham crackers and a stick of chewing gum. On the breakfast menu are powdered soluble coffee with sugar, malted milk tablets and veal loaf. For lunch, in addition to pemmican biscuit, the ration package contains a ham loaf tin, bouillon paste and dextrose tablets. Supper adds pork-beef sausage, chocolate fudge and tablets for making lemonade.

During the test the hikers were accompanied by an Army truck carrying laboratory equipment and an extra water supply. Each hiker carried a 20 pound pack, including two blankets, mess kit and three days of emergency rations. The men were weighed each morning and night and given other tests during their trip.

FEDERAL AID FOR TRAINING NURSES

Eighty-eight schools of nursing were selected by the U. S. Public Health Service, October 10, to receive federal aid in training additional student nurses. Sixty-seven schools in thirty-two states will offer refresher courses to three thousand graduate nurses, and twenty-six schools will enroll five hundred graduate nurses for postgraduate study. A total of \$1,200,000 is available for the program, which includes field training centers for public health nursing.

The student-nurse training program will increase enrolment by two thousand young women in this country, Hawaii and Puerto Rico. Surgeon General Parran has estimated a need for fifty thousand student nurses this year, and the federal program will bring the total to about forty-two thousand. The average yearly enrolment is slightly under forty thousand. It is hoped that schools able to increase their enrolment without federal aid will meet the deficiency.

The federal grants will be made at the end of each quarter of the school year except in cases in which tuition is required in advance. The eighty-eight schools of nursing were selected from a list of three hundred applications. The \$1,200,000 was made available by the Federal Security Agency Appropriation Act to help meet a national shortage of nurses created by increased demands of the armed services and defense industries. The money will be spent as follows (all figures are approximate): for student training \$900,000, for postgraduate courses \$125,000, for public health training \$50,000 and for refresher courses \$125,000.

ENGLAND NEEDS SURGICAL INSTRUMENTS

The approach of winter fogs and the expected renewal of bombing raids has intensified Great Britain's need for medical and surgical equipment. The Duchess of Leinster, director of the surgical instruments division of Bundles for Britain, 745 Fifth Avenue, New York City, has made an appeal for immediate action to help meet the needs of the overcrowded hospitals in Britain. The duchess appealed to all doctors, dentists and hospitals throughout the United States to contribute their surplus instruments without delay, including scalpels, retractors, osteotomes, bone knives and instruments necessary for obstetric, gynecologic, cranial and major and minor surgery. New and used surgical instruments may be sent to the Bundles for Britain Warehouse, 112 West 89th Street, New York City, where a committee of surgeons sorts them and when necessary arranges for their reconditioning before shipment. In addition to surgical instruments, money to purchase other hospital supplies for operating and delivery rooms is needed.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—H. R. 3864 has passed the House and Senate and has been approved by the President, proposing to amend an act for the registry of pursers and surgeons as staff officers on vessels of the United States. Prior to the enactment of this law, senior registered surgeons and other surgeons, if any, and their assistants or aides on vessels of the United States were placed under the charge of the senior registered purser. Now a separate medical division of the staff department has been created, to be under the charge of the senior registered surgeon of the vessel, who will be responsible solely to the master of the vessel. H. R. 3484 has passed the House and Senate and has been approved by the President, providing retirement pay and hospital benefits to Reserve officers of the Army who were called or ordered into the active military service for a period in excess of thirty days on or subsequent to Feb. 28, 1925, other than for service with the Civilian Conservation Corps, and who are now disabled from disease or injury contracted or received in line of duty while so employed. H. R. 143 has passed the House, conferring the benefits of hospitalization and privileges of the soldiers' homes on persons who served in a civilian capacity under the jurisdiction of the Quartermaster General during the Spanish-American War, the Philippine Insurrection or the China Relief Expedition on vessels owned by the United States and engaged in the transportation of troops, supplies, ammunition or materials of war and who were discharged for disability incurred in such service in the line of duty. H. R. 4853 has passed the House, authoriz-

ing hospitalization of retired officers and enlisted men who are war veterans, in Veterans' Administration facilities under contract on parity with other war veterans. S. 1546 has been indefinitely postponed, proposing to authorize the production of poppies for seed purposes only. A subcommittee of the Senate Committee on Military Affairs has concluded hearings on S. 1504, a bill to amend the Selective Training and Service Act so as to provide for the deferment, in time of peace, of certain college and university students until the end of any academic year during which they are selected for training and service.

Bills Introduced.—S. 1921, introduced by Senator Gillette, Iowa, and H. R. 5700, introduced by Representative Andresen, Minnesota, propose to prohibit the shipment and sale in interstate and foreign commerce of oleomargarine containing any milk or its products, or which is yellow in color, or which is in semblance or imitation of butter as to color, flavor or appearance. S. 1947, introduced by Senator Schwartz, Wyoming, proposes to authorize pensions for certain physically or mentally helpless children. H. R. 5698, introduced by Representative Voorhis, California, proposes to establish under the Fish and Wildlife Service of the Department of the Interior a research laboratory in Los Angeles County, Calif., to study the diseases of domestic rabbits. H. R. 5780, introduced by Representative Scrugham, Nevada, proposes to amend the Selective Training and Service Act to provide for the enrolment in the Civilian Conservation Corps, for the purpose of physical rehabilitation and training, of such men as may be deferred because of temporary physical deficiencies or defects.

WOMAN'S AUXILIARY

New York

The Schenectady County auxiliary was addressed by Mrs. T. Y. Chien on "Conditions in China and the Needs of the Chinese People." The auxiliary with the Schenectady chapter of the American committee for medical aid to China sponsored a benefit concert, May 17, in the Union College Memorial Chapel. Dr. Robert C. Maxon is acting chairman for Schenectady County. A donation was made toward the Campership Fund of the Schenectady Girl Scout Council and another to the Girls' Club of Schenectady.

The sixth annual meeting of the Woman's Auxiliary to the Medical Society of New York convened in Buffalo, April 28 to May 1. Three hundred and twenty-nine doctors' wives were registered. The opening meeting was called to order by the president, Mrs. Luther H. Kice. Mrs. V. E. Holcombe, national president of the woman's auxiliary, was guest of honor. Three counties—Essex, Montgomery and Niagara—were organized during the year. Speakers on Monday were Dr. James Flynn, president, and Dr. Louis H. Bauer, speaker of the house of delegates of the state society. Mrs. George B. Adams, the incoming president, presided at the postconvention meeting, which was addressed by Dr. Samuel J. Kopetzky, the incoming president of the state society. The project for the new year will continue to be the Physician's Home. At the sixth annual Birthday Dinner in the ballroom of the Hotel Statler, Mrs. V. E. Holcombe was the guest speaker. A silver tray was presented to Mrs. Luther H. Kice as retiring state president. Pins were given to all past state presidents. On Wednesday there was a luncheon at which the auxiliary was honored by the presence of Dr. Nathan B. Van Etten, President of the American Medical Association. The speakers were Dr. Charles Gordon Heyd and Dr. A. H. Aaron. A fashion show was presented during the luncheon, and Mrs. Clyde L. Randall entertained with a whistling solo.

Pennsylvania

Miss Eve Curie, distinguished daughter of the world famous scientist Madame Marie Curie, recently lectured on "The Magic of Radium" at the Central High School Auditorium in Scranton. The honor and pleasure of bringing this internationally famous person to Scranton belongs to the auxiliary to the Lackawanna County Medical Society and the Scranton Branch of the American Association of University Women. Proceeds of the lecture were applied to the Medical Benevolence Fund and the National Fellowship Fund of the A. A. U. W.

A regular meeting was held in the Chamber of Commerce Lounge, Scranton. Mrs. Louis A. Milkman, president, presided. Mrs. Malcolm Oettinger, mental hygiene consultant of the Visiting Nurses Association, spoke on "The Psychologic Effect of Illness on Children."

The annual health program of the Lehigh County auxiliary, held in Allentown at the Woman's Clubhouse in April, was attended by two hundred representatives of fifty women's organizations. The speaker, Dr. Gilson Colby Engel of Philadelphia, was presented by Mrs. Paul W. Ramer, chairman of public relations, who with the assistance of Mrs. Frederick R. Bausch Sr. arranged for the health program. Dr. Engel told the women what they should know about cancer. After the talk he answered questions from the audience. Mrs. Elmer H. Bausch, the president, greeted the gathering, and after the program a reciprocity tea was held during which Matt Gillespie of Catasauqua and Jack Kline of Bethlehem provided a background of music.

The Mifflin County auxiliary had a luncheon at Lewistown, recently, in honor of Mrs. Maxwell Lick, president of the state auxiliary, and Mrs. Walter Orthner, councilor of the Sixth District. Mrs. George R. Barnett, Hygeia chairman, reported that twenty-six subscriptions had been secured. After the meeting an enjoyable time was had playing bridge.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Industrial Hygiene Unit.—The Los Angeles County Department of Health has established a bureau of industrial hygiene. Dr. Hugh E. Dierker Jr. and Mr. Frank Stead, an engineer, have been named to the staff. The Division of Industrial Hygiene of the National Institute of Health, Washington, D. C., will lend a chemist to the new bureau.

Society News.—The Los Angeles County Medical Association and the tuberculosis section will devote a round table discussion, October 28, to "Tuberculosis Problems Met in General Practice." Dr. Henry Chesley Bush, Livermore, chief of the tuberculosis service of Alameda County, will be the moderator.—Dr. Alson R. Kilgore, San Francisco, addressed the Hollywood Academy of Medicine, October 9, on "The Benign Proliferative Disorders of the Breast—Their Differentiation from and Their Relation to the Development of Cancer."—The Los Angeles Obstetrical and Gynecological Society and the Trudeau Society of Los Angeles cooperated in a program October 14. The speakers were Drs. Charles R. Castlen, Glendale, on "Present Day Concepts of Tuberculosis in Pregnancy"; Eakle W. Cartwright, Pasadena, "Incidence of Tuberculosis in Pregnant Women," and Conrad J. Baumgartner, Los Angeles, "The Thyroid in Pregnancy."

CONNECTICUT

New Chief of Health Administration.—Dr. Henry R. O'Brien, Olean, N. Y., has been appointed chief of the division of local health administration of the Connecticut State Department of Health. He succeeds Dr. Franklin M. Foote, Hartford, who resigned to become health commissioner of the Kips Bay-Yorkville health district in New York. Dr. O'Brien formerly served as health commissioner of Cattaraugus County in New York.

Society News.—The Fairfield County Medical Association was addressed, October 1, by Dr. Eugene La Forrest Swan, Brooklyn, on "Emotional Problems in Children."—At a meeting of the New London County Medical Association in Norwich, October 2, Drs. Irving J. Walker and Franklin W. White, Boston, discussed intestinal obstruction.—Dr. Norman Jolliffe, New York, discussed "Neuropsychiatric Manifestations of Vitamin Deficiencies" before the Yale Medical Society in New Haven, October 8.

ILLINOIS

Typhoid Carrier Aged Ninety-Seven.—The state department of health has found the oldest typhoid carrier ever discovered in Illinois, according to the *Illinois Health Messenger*. One month after the woman, aged 97, moved into the home of her daughter, a woman member of the household died from typhoid. The subsequent investigation disclosed the elderly woman to be a carrier.

District Postgraduate Conference.—The Illinois State Medical Society will conduct a postgraduate conference in the Fourth Councilor District in Moline, October 23, with Dr. Paul P. Youngberg, Rock Island, president of the Rock Island County Medical Society, presiding. Chicago physicians will present the following program: Drs. Cleveland J. White on "Common Diseases of the Skin and Their Management"; Edwin M. Miller, "Bowel Obstruction in the Newborn Infant," and Drs. Robert S. Berghoff and Donald A. Hirsch, who will conduct a clinic on the heart. Dr. Ford K. Hick, captain, U. S. Army General Dispensary, Chicago, will speak in the evening on "The Duties of the Medical Officer."

Chicago

University News.—In a symposium on "Current Trends in Neuropsychiatry" at the University of Illinois College of Medicine, October 11, Dr. Eric Oldberg, professor of neurology and neurologic surgery at the school, reviewed the field of neurology and neurologic surgery; Dr. Francis J. Brace-land, dean of Loyola University School of Medicine, the field of psychiatry, and Dr. Ernst Gelhorn, professor of physiology at Illinois, the field of neurophysiology.

Major Armstrong to Give the Gehrman Lectures.—Major Harry G. Armstrong, medical division, U. S. Army Air Corps, School of Aviation Medicine, Randolph Field, Texas, will deliver the Gehrman Lectures for 1941-1942 of the University of Illinois College of Medicine in room 423, Medical and Dental College Laboratories Building, October 21-22. Major Armstrong's subjects will be "Medicine in Aviation," "Selection and Care of Fliers" and "Effects of Flight on Man."

Society News.—The Chicago Roentgen Society was addressed, October 9, by Drs. Frank E. Simpson and James Ernest Breed on "Radium Treatment of Cancer of the Cervix Uteri."—Dr. Wallace H. Cole, St. Paul, discussed "Some Recent Medical and Surgical Experiences in England" before the Chicago Orthopedic Society, October 10, and Dr. Wilbur Stuart Wood, Decatur, Ill., presented the candidate's thesis on "Convalescent Treatment of Poliomyelitis."—Dr. Otto Saphir delivered the presidential address, among other speakers, before the Chicago Pathological Society on October 13; his subject was "Precancerous Lesions."—Dr. Frederick Hiller, recently of Geneva, Switzerland, discussed "Cerebral Circulatory Disturbances" before the German Medical Society of Chicago, October 6.

Annual Reunion.—The tenth annual reunion of the Alumni Association of the University of Chicago, the School of Medicine, was held in the Chicago Lying-in Hospital September 25. The following spoke:

Dr. Townsend B. Friedman, Immunologic Response of Allergic Children to Toxoid.

Dr. Victor E. Johnson, Studies on Cardiac Output.

Dr. Miguel Drobinsky, Estelline, S. D., Effects of Nicotinic Acid on Lupus Erythematosus.

Dr. John H. Glynn, Safety Control of Pharmaceutical Products.

Dr. Joseph Garrott Allen, Prothrombin in Liver Disease.

Dr. John Van Prohaska, Surgical Treatment of Esophageal Obstruction.

Dr. William W. Scott, Urinary Phosphatases.

Dr. Henry N. Harkins, Detroit, Use of Pectin as a Blood Substitute in Shock and Hemorrhage.

Dr. Dallas B. Phemister, professor of surgery at Chicago, gave the principal address at the banquet in the evening.

KANSAS

Course on Heart Disease.—Dr. Tinsley R. Harrison, professor of medicine, Bowman Gray School of Medicine, Winston-Salem, N. C., conducted the annual postgraduate course on heart disease of the committee on study of heart disease of the Kansas Medical Society and the Kansas Heart Association in Emporia, September 29-October 2.

New State Ophthalmologist.—Dr. Hazen L. Kirkpatrick, Topeka, has been appointed state supervising ophthalmologist by the Kansas State Board of Social Welfare. He succeeds Dr. John A. Billingsley, Kansas City, who resigned, September 1, in accordance with a policy observed for that office of rotating the position among ophthalmologists of the state for terms of eighteen months.

Joint Meeting on Obstetrics.—A joint meeting of the Kansas Obstetrical and Gynecological Society and the Golden Belt Medical Society was held in Salina, October 2. The speakers included Drs. Christian A. Hellwig, Wichita, on "Pathology of Goiter"; Joseph A. Weinberg, Omaha, "Surgery of Suppurative Diseases of the Thorax"; George A. Young, Omaha, "Problem and Management of Arthritis," and John L. McKelvey, Minneapolis, "Recent Advances in Chemotherapy in Obstetrics." Dr. McKelvey also addressed the dinner session on "Complications of Pregnancy and Delivery." The state group sponsored the program.

MARYLAND

Society News.—The Baltimore City Medical Society was addressed, October 3, by Lieut. Col. Amos R. Koontz, medical director, Selective Service System for Maryland, "Defects in Men of Military Age Discovered by Selective Service"; Major Henry M. Thomas Jr., chief, medical section, Station Hospital, Fort George G. Meade, "The Health of Selectees in Training," and Dr. Robert H. Riley, Baltimore, state health director, "Public Health Aspects of Selective Service." The society was addressed, October 17, by Drs. John S. Davis on "The Care of Wounds" and Huntington Williams, commissioner of health of Baltimore, "To London and Back in War Time."

Semiannual Meeting of State Society.—The Medical and Chirurgical Faculty of Maryland held its semiannual meeting in Easton, October 9. Dr. Jacques Tyler Baker, Easton, president of the Talbot County Medical Society, gave the address of welcome and Dr. Harvey B. Stone, Baltimore, president of

the society, the response. Other speakers included Drs. William Barry Wood Jr., Baltimore, on "Bacterial-Chemotherapy" and Col. Leonard G. Rowntree, chief, medical division, Selective Service System, Washington, D. C., "Some Medical Problems of the Selective Service System."

MASSACHUSETTS

The Cutter Lecture.—Sir William Wilson Jameson, chief medical officer, Ministry of Health, London, England, will deliver the Cutter Lecture on Preventive Medicine at the Harvard Medical School, Boston, October 22. His subject will be "Public Health in Britain at War."

New Health Center at Wellesley.—A new wing is now being added to Simpson Infirmary at Wellesley College, Wellesley, which, with present accommodations, will serve as a health center for the entire college community of students, faculty, staff members and employees. The present infirmary provides facilities for 23 patients and has been in service since 1908. Newspapers reported that about five thousand treatments in the clinic and fifteen hundred in the physical therapy room have been given in a single year. It is hoped that the unit will be ready for use in December.

The Dunham Lectureship.—The Edward K. Dunham Lectures for the Promotion of the Medical Sciences will be delivered at Harvard Medical School, Boston, October 28-30, on the general subject of "Problems in Intermediary Metabolism." The lectures were prepared by the late Dr. Rudolf Schoenheimer, associate professor of biologic chemistry, Columbia University College of Physicians and Surgeons, New York, but will be delivered by Hans T. Clarke, Sc.D., professor and head of the department of biochemistry at Columbia. The titles of the lectures are "The Chemical Reactions of the Body Fats," "The Chemical Reactions of the Body Proteins" and "The Dynamic State of the Body Constituents."

MINNESOTA

Alumni Meeting.—The annual clinical program and meeting of the Minnesota Medical Alumni Association will be held October 31, the day before Homecoming, in the University Hospitals, Minneapolis. Speakers will be:

Dr. Wesley W. Spink, Minneapolis, Sulfonamide Therapy.
Dr. Lawrence R. Boies, Minneapolis, Hearing Loss in Childhood.
Dr. Lloyd H. Ziegler, Wauwatosa, Wis., Reactions of Psychotic Individuals to Surgery.
Dr. Harry W. Christensen, Minneapolis, Anorectal Diseases.
Dr. Miland E. ... Medical Therapy of Fractures.
Dr. Erling S. F. ... Serum Therapy.

The luncheon meeting in the Coffman Memorial Union will be addressed by Dr. Wallace H. Cole, St. Paul, on "Recent Experiences in England."

MONTANA

Plague Infection.—According to *Public Health Reports*, plague infection has been proved in tissue from each of two ground squirrels found dead on July 18 at a location 5 miles north of Sula, in Ravalli County.

NEBRASKA

Omaha Clinical Assembly.—The ninth annual assembly of the Omaha Mid-West Clinical Society will be held at the Hotel Paxton, October 27-31. Features of the meeting will be addresses by guest and local speakers, clinics, motion pictures and round table discussions. The guest speakers will include:

Dr. H. Earle Conwell, Birmingham, Ala., Fractures About the Elbow, Especially in Children; also Treatment of Nonparalytic Fractures of the Spine.
Dr. Albert M. Snell, Rochester, Minn., Recent Advances in Vitamin Therapy; also Supposedly Rare Conditions Producing Abdominal Pain.
Dr. Joseph A. Johnston, Detroit, Hypothyroid States in Childhood, also The Metabolism of Adolescence and Its Relation to Disease at That Age.
Dr. Charles C. Higgins, Cleveland, Management of Infections of the Urinary Tract; also Symptoms, Diagnosis and Treatment of Ureteral Calculi.
Dr. Arthur J. Bedell, Albany, N. Y., Medical Ophthalmoscopy; also Ophthalmoscopic Evidence of Injury to the Eyes.
Dr. Everett D. Kiefer, Boston, Special Problems in the Management of Peptic Ulcer; also Chronic Ulcerative Colitis.
Dr. William Osler Abbott, Philadelphia, Nonsurgical Treatment of Obstruction of the Bowel; also Action of Drugs on the Alimentary Tract.
Dr. S. Bernard Wortis, New York, Injury to the Brain and Spinal Cord; also Brain Metabolism and Neuropsychiatric Disorders.
Dr. Walter Estell Lee, Philadelphia, Local, Systemic and Visceral Changes in Severe Burns of the Body Surfaces; also Surgical Treatment of Regional Ileitis and Necroticities.
Dr. John L. McKelvey, Minneapolis, Etiology and Treatment of Premature Separation of Normally Implanted Placenta; also Arteriosclerotic Toxemia of Pregnancy.

Dr. Harry E. Mock, Chicago, Surgery of Trauma: Problems in Diagnosis and Treatment; also Management of Skull Fractures: A Nationwide Survey of 6,500 Consecutive Cases.

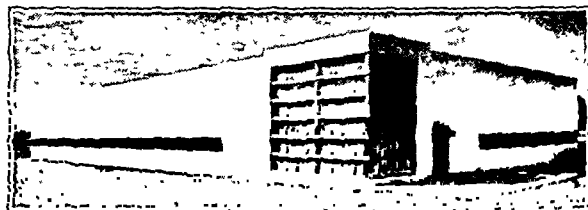
Dr. Byrl R. Kirklín, Rochester, Minn., Early Manifestations of Gastrointestinal Cancer.

Dr. Percy S. Pelouze, Philadelphia, Chemotherapy in Gonorrhea.

Dr. Kirklín will also take part in a symposium on radiologic diagnosis in which the other speakers will be Drs. Clarence O. Simpson, St. Louis; William Walter Wasson, Denver; Leo G. Rigler, Minneapolis, and Thomas Leon Howard, Denver.

NEW JERSEY

Ligature Laboratory Dedicated.—A new laboratory for the production of surgical ligatures was dedicated by Johnson & Johnson at its plant near New Brunswick, September 25. The new building is one of a group of proposed industrial operations which will be developed around the unit plan of management. The exterior is of Vermont marble and stainless steel. The interior is divided into two major areas, two thirds



Ligature Laboratory.

of the space being allocated to the production of ligatures and one third to reception rooms, offices and dressing rooms for the laboratory technicians. Within the area devoted to ligatures is a "building within a building" where the finished ligatures are sterilized and hermetically sealed in glass tubes. The inner building, with walls of "vitrolite" plate glass, is air conditioned, has fluorescent lighting, and is 190 feet long, 102½ feet wide and 24 feet high. The dedication was preceded by a luncheon at the St. Regis Hotel in New York, attended by officials and special guests.

NEW YORK

Maternal Welfare Day.—A regional "maternal welfare teaching day" was held at the University of Buffalo School of Medicine, October 16, with the following speakers, all of Buffalo:

Dr. Louis A. Siegel, Maternal Mortality Investigation in Buffalo.
Dr. Francis C. Goldsborough, Treatment of the Toxemias of Pregnancy.
Dr. William Herbert Burwig, Diagnosis and Treatment of Bleeding in the Third Trimester.
Dr. Hugh C. McDowell, Treatment of Postpartum Hemorrhage.
Dr. Milton G. Potter, Technique of Breech Extraction.
Dr. Edward G. Winkler, Forceps Technique.

District Meeting.—The Third District Branch of the Medical Society of the State of New York held its annual meeting in Catskill, September 30. The program was devoted to discussions by the following officers and chairmen of committees of the state society: Drs. Samuel J. Kopetzky, New York, president; Peter Irving, New York, secretary and general manager; Joseph S. Lawrence, Albany, executive officer; Edward T. Wentworth, Rochester, chairman of the finance committee; John L. Bauer, Brooklyn, committee on legislation; Augustus J. Hambrook, Troy, public relations and economics; Oliver W. H. Mitchell, Syracuse, public health and education; Floyd S. Winslow, Rochester, medical publicity; Clarence G. Bandler, New York, workmen's compensation and also the committee on malpractice defense and insurance; David J. Kaliski, New York, director of the workmen's compensation bureau; Mr. Dwight Anderson, director of the public relations bureau, and Mr. Lorenz Brosnan, counsel for the society.

New York City

First Harvey Lecture.—Dr. Haldan Keffer Hartline, assistant professor of biophysics, Johnson Research Foundation, University of Pennsylvania School of Medicine, Philadelphia, will deliver the first Harvey Society Lecture of the current series at the New York Academy of Medicine, October 30. His subject will be "Nervous Activity and Visual Mechanisms."

Society News.—The stated meeting of the New York Academy of Medicine, October 2, was devoted to the memory of the late Sir Frederick G. Banting. Dr. Charles H. Best, who succeeded Dr. Banting as director of the department of

physiology and the Banting and Best Department of Medical Research, University of Toronto Faculty of Medicine, made a memorial address and a scientific address on "Prevention of Diabetes from the Experimental Viewpoint," and Dr. Elliott P. Joslin, Boston, spoke on "The Use of Insulin in Its Various Forms in the Treatment of Diabetes."

Dr. Babbott Resigns from Long Island College.—Dr. Frank L. Babbott, president of the Long Island College of Medicine since 1931, has resigned because of ill health, the *New York Times* reported on September 30. The announcement was made at the opening exercises of the school for the fall term. Dr. Babbott graduated from Columbia University College of Physicians and Surgeons in 1918. He was first associated with Long Island College as associate in pediatrics in 1925 and was made assistant dean in 1927 and president in 1931. He will continue his association with the school as chairman of the committee on education of the board of trustees. Dr. Jean A. Curran, dean of the college, will be acting president.

United Hospital Fund Campaign.—The United Hospital Fund and the Visiting Nurse Association of Brooklyn opened their sixty-third annual appeal for funds October 14. This year's goal is \$1,784,292, which will be distributed among seventy-five voluntary hospitals in the five boroughs, principally to cover deficits arising from the furnishing of free medical care to the needy. These hospitals receive no tax support and supply about one half of their services free. Mr. David H. McAlpin Pyle, president of the United Hospital Fund, pointed out in his annual report that the hospitals now have to compete with many worthy patriotic fund-raising appeals and also that the defense program has brought about two difficulties—rising costs and the drain of hospital personnel by private and governmental agencies. Roy E. Larsen, president of Time, Inc., and publisher of *Life*, is general chairman of the campaign.

Institute for Hospital Administrators.—The American College of Hospital Administrators will conduct the New York Institute for Hospital Administrators at Cornell University Medical College, October 20-31. Cooperating organizations will be, in addition to the medical college, the Greater New York Hospital Association, the Hospital Council of Greater New York and the hospital associations of New York, Connecticut, Maine, Massachusetts, New Jersey, Pennsylvania and Rhode Island. The program will consist of addresses, group conferences, panel discussions and field trips. Among the speakers will be:

- Dr. William Edward Chamberlain, Philadelphia, X-Ray Service (in group conference).
- Dr. Charles F. Wilinsky, Boston, The Hospital's Role in Public Health Programs.
- C. Rufus Rorem, Ph.D., Chicago, Group Plans for Hospital Service and Medical Care.
- Dr. Watson S. Rankin, Charlotte, N. C., Standards of Administration in Small Hospitals.
- Dr. Claude W. Munger, New York, Hospitals and the Government.
- Dr. Albert G. Engelbach, Cambridge, Mass., Preparing the Hospital for War Conditions.
- Dr. Clarence O. Cheney, White Plains, Mental Diseases and the General Hospital.
- Dr. Gerald F. Houser, superintendent of the Red Cross-Harvard Hospital, London, Hospital Administration Under Wartime Conditions.

OKLAHOMA

Clinical Conference at Oklahoma City.—The eleventh annual conference of the Oklahoma City Clinical Society will be held October 27-30 at the Biltmore Hotel. Among the speakers will be:

- Dr. Fred W. Rankin, Lexington, Ky., President-Elect of the American Medical Association.
- Dr. Walter C. Alvarez, professor of medicine, University of Minnesota Graduate School, Minneapolis-Rochester.
- Dr. Perrin H. Long, professor of preventive medicine, Johns Hopkins University School of Medicine, Baltimore.
- Dr. Everett D. Plass, professor and head of the department of obstetrics and gynecology, State University of Iowa College of Medicine, Iowa City.
- Dr. A. Bruce Gill, professor of orthopedic surgery, University of Pennsylvania School of Medicine, Philadelphia.
- Dr. Verne C. Hunt, clinical professor of surgery, University of Southern California School of Medicine, Los Angeles.
- Dr. Gilbert J. Thomas, clinical associate professor of urology, University of Minnesota Medical School, Minneapolis, and clinical professor of surgery at the graduate school.
- Dr. Earl D. Osborne, professor of dermatology and syphilology, University of Buffalo School of Medicine.

PENNSYLVANIA

Society News.—Dr. James S. Taylor, Altoona, addressed the Dauphin County Medical Society, Harrisburg, October 14, on "Cesarean Section."—Dr. Henry J. Tumen, Philadelphia, will address the Harrisburg Academy of Medicine, October 21,

on "Jaundice, Differential Diagnosis and Management."—Dr. Charles Howard Marcy, Pittsburgh, addressed the Blair County Medical Society, September 23, at the State Tuberculosis Sanatorium, Cresson, on "Collapse Therapy in Tuberculosis."—Drs. Edmund R. McCluskey and James O. Wallace, Pittsburgh, will address the Westmoreland County Medical Society at the Mountain View Hotel near Greensburg, November 4, on infantile paralysis.—Dr. Paul Titus, Pittsburgh, addressed the Washington County Medical Society, Washington, October 15, on "Recent Advances in Obstetrics."

Philadelphia

Course in Industrial Hygiene.—A twelve week course in industrial hygiene will open October 27 at the University of Pennsylvania to continue through January 17, under the auspices of the engineering, science and management defense training program of the U. S. Office of Education; it is open to graduates in engineering, chemistry or allied sciences. Additional information may be obtained from Theodore Hatch, M.S., associate professor of industrial hygiene, department of public health and preventive medicine, University of Pennsylvania School of Medicine.

Symposium on Health of Youth.—The section on public health, preventive and industrial medicine of the College of Physicians of Philadelphia presented a symposium on "The Health of American Youth" at a meeting, October 6, with the following speakers: Drs. Walter S. Cornell, on "Physical Condition of Philadelphia Public School Children and the Correction of Existing Diseases and Defects"; Harry D. Lees, "Defects in College Freshmen—How Found and How Dealt With"; William Egbert Robertson, "The Health of NYA Youth," and Col. Leonard G. Rowntree, medical director, Selective Service System, Washington, D. C., "Health Findings Under the Selective Service Examination and Their Implications."

Schireson Sentenced on Perjury Charge.—Henry J. Schireson, plastic surgeon of dubious renown and considerable notoriety, was sentenced to a year and a day in a federal penitentiary and fined \$500 after he pleaded nolo contendere to a charge of perjury, according to the *Philadelphia Evening Public Ledger*, September 29. At the same time he was sentenced to a year and a day on a charge of concealing assets from creditors when he went into bankruptcy. He changed a plea of not guilty on this charge to nolo contendere. The two sentences will run concurrently. Schireson went into bankruptcy in 1937. When he was indicted in 1939 it was said that he had concealed assets of \$130,000. It was also said that he swore he was not married. Government agents found a strong box in which Schireson had valuable assets and a marriage certificate showing that he had been married in 1932, according to the newspaper report.

RHODE ISLAND

Hospital Alumni Clinic Day.—The ninth annual Intern Alumni Clinic Day of Memorial Hospital, Pawtucket, will be held on October 22. The morning session will be devoted to presentation of cases, and in the afternoon the following program will be given by members of the faculty of George Washington University School of Medicine, Washington, D. C.:

- Dr. Garnet W. Ault, Treatment of Common Rectal Diseases in General Practice.
- Dr. William J. Cusack, Office Treatment of Vulvar, Vaginal and Cervical Lesions.
- Dr. Frederick O. Coe, X-Ray Diagnosis of Lesions of the Urinary Tract.
- Dr. Wallace M. Yater, Heart Disease Amenable to Surgery.
- Dr. John F. Kenney, Pawtucket, is in charge of arrangements.

SOUTH CAROLINA

Society News.—The annual meeting of the Seventh District Medical Society was held in Georgetown, September 11, with the following speakers, among others: Drs. Frederick E. Kredel, Charleston, on "Temporary Nerve Paralysis"; Hal M. Davison, Atlanta, Ga., "Infestation of the Intestinal Tract," and Austin T. Moore, Columbia, "Metal Replacement of the Hip Joint."—Dr. Lonita M. Boggs, Greenville, addressed the Greenville County Medical Society, Greenville, October 1, on "Sulfaguanidine in Diarrhea in Infancy" and Mr. Proctor A. Bonham, Greenville attorney, on "Medical Jurisprudence."—Dr. Harrison H. Shoulders, Nashville, Tenn., addressed the Columbia Medical Society, Columbia, September 8, on the diagnosis of acute abdominal conditions.

WASHINGTON

State Obstetric Meeting.—The fall meeting of the Washington State Obstetrical Association was held in Spokane, October 4, with Dr. Albert W. Holman, Portland, Ore., as the guest speaker. Dr. Holman made several addresses, and other speakers included Drs. John F. Fiorino, Everett, on "Endocrine Preparations and Their Use in Obstetrics"; Arthur E. Lewis, Seattle, "Complications of Episiotomy," and Philip H. Henderson, Longview, "Progestin in Obstetric Complications."

WISCONSIN

Seminar on Teaching History of Pharmacy.—The American Institute of the History of Pharmacy at the University of Wisconsin, Madison, conducted its first seminar on the teaching of the history of pharmacy in July. Eighteen teachers of pharmacy, pharmacology and pharmacognosy attended. Papers were presented and discussed on the following subjects, among others: the scope of the history of pharmacy, biographies as subject and material of the history of pharmacy, survey of pharmaceutico-historical literature and development of the pharmaceutico-historical movement. The institute was recently established with George Urdang, D.Sc. Nat., formerly director of the German Society of the History of Pharmacy (THE JOURNAL, July 12, page 129), as director.

GENERAL

Dates for Examination in Psychiatry Changed.—The next examinations of the American Board of Psychiatry and Neurology will be held in New York December 17-18. The dates December 19-20 were originally announced, but the change was made to avoid conflict with the meeting of the Association for Research on Mental and Nervous Diseases.

Laryngology and Rhinology Award.—The American Laryngological Association has now available a sufficient sum of money to be granted as a prize for a thesis dealing with original investigation and research in the art and science of laryngology and rhinology. This prize is known as the Casselberry Award. Theses or reports of work must be in the hands of the secretary before March 1, 1942. Additional details may be obtained from Dr. Charles J. Imperatori, secretary of the American Laryngological Association, 108 East Thirty-Eighth Street, New York.

U. S. Pharmacopeia Conference.—Open conferences for the consideration of proposed U. S. Pharmacopeia XII standards will be held at the Bellevue-Stratford Hotel, Philadelphia, October 28 to 31. The conferences on October 28 and 29 will be for consideration of monographs for chemicals; that on October 30 will be for consideration of monographs on volatile oils, tablets, capsules and injections, and that on October 31 for consideration of monographs on biologic vegetable drug assays, botanicals, galenicals and others. All persons who wish to present suggestions, criticisms or comments are invited to attend these open conferences. Those who wish to present specific recommendations are requested so far as possible to submit them in writing, in advance, preferably in duplicate. Write to the chairman of the Committee of Revision, E. Fullerton Cook, Forty-Third Street and Woodland Avenue, Philadelphia, for registration blanks.

Insurance Medical Directors.—The fifty-second annual meeting of the Association of Life Insurance Medical Directors of America will be held at the Hotel Pennsylvania, New York, October 23-24, under the presidency of Dr. Donald B. Cragin, Hartford, Conn. The scientific program will be:

- Dr. John L. Rice, commissioner of health of New York City, Public Health Today.
- Drs. Robert M. Daley, medical director, Harry E. Ungerleider, assistant medical director, and Richard S. Gubner, Equitable Life Assurance Society, Prognosis and Insurability of Hypertension with Particular Reference to the Electrocardiogram.
- Dr. Joyce Ten Eyck Sheridan, Philadelphia, assistant medical director, Fidelity Mutual Life Insurance Company, The Transverse Diameter of the Frontal Aortic Silhouette.
- Dr. Burrill B. Crohn, New York, Achlorhydria and Its Ultimate Significance.
- Louis I. Dublin, Ph.D., and Mr. Herbert H. Marks, Metropolitan Life Insurance Company, New York, Inheritance of Longevity—A Study Based on Life Insurance Records.
- Dr. Halbert L. Dunn, chief statistician for vital statistics, U. S. Bureau of Census, Washington, D. C., Vital Statistics and Life Insurance in a Changing World.
- Dr. Edgar V. Allen, Rochester, Minn., Peripheral Arterial Diseases.
- Dr. Edward S. Dillon, Philadelphia, assistant medical director, Penn Mutual Life Insurance Company, Recent Developments in Diabetes.
- Dr. McLeod C. Wilson, Hartford, Conn., medical director, accident and group department, Travelers Insurance Company, Heart Tolerance Following Coronary Episodes (motion picture).

The Poliomyelitis Situation.—Several states continue to report new cases of poliomyelitis. In Pennsylvania the ban on opening the schools was lifted in nine counties, September 26, but new closings were reported, September 30, in several communities in Chester, Delaware and Berks counties because new cases appeared.—Six new cases reported on October 3 in Illinois brought the state total for 1941 to that date to 268. Of this total 152 have been in Cook County and 116 downstate.—Schools were closed in Camden County, N. J., September 24, for one week, when 4 cases were discovered, and the order was extended to October 6, when a new case developed on September 30. The sixth death in Bergen County, N. J., was reported on October 8, and a school in Lyndhurst was closed on October 5 after a pupil developed the infection.—Nine cases were reported in the District of Columbia in the first ten days of October, making the total for the year 59 cases. Sixty cases have been brought into District hospitals from adjacent counties, according to newspaper reports.

Award for Best Research on Vitamin B.—Nominations are solicited for the 1942 award of \$1,000 established by Mead Johnson & Co. to promote researches dealing with the B complex vitamins. The recipient of this award will be chosen by a committee of judges of the American Institute of Nutrition and the formal presentation will be made at the annual meeting of the institute in Boston on April 1, 1942. The award will be given to the laboratory (nonclinical) or clinical research worker in the United States or Canada who, in the opinion of the judges, has published during the previous calendar year January 1-December 31 the most meritorious scientific report dealing with the field of the "B-complex" vitamins. If in their judgment circumstances and justice so dictate, it may be recommended that the prize be divided between two or more persons. It may also be recommended that the award be made to a worker for valuable contributions over an extended period but not necessarily representative of a given year. Membership in the American Institute of Nutrition is not a requisite of eligibility for the award. To be considered by the committee, nominations for this award for work published in 1941 must be in the hands of the secretary by Jan. 10, 1942. The nominations should be accompanied by such data relative to the nominee and his research as will facilitate the task of the committee in its consideration of the nomination. Arthur H. Smith, Ph.D., Wayne University College of Medicine, Detroit, is the secretary of the American Institute of Nutrition.

Association of the History of Medicine.—The semi-annual meeting of the American Association of the History of Medicine will be held at the University of Kansas Medical School, Kansas City, Kan., October 24-25, under the auspices of the Quivira Medical History Club of Western Missouri and Kansas. The speakers will include:

- Dr. Edward H. Skinner, Kansas City, Mo., Early Roentgen Literature of the United States.
- Dr. Bert F. Keltz, Oklahoma City, Indian Medicine in the Southwest.
- Dr. Thor J. Jager, Wichita, Kan., Bibliographic Notes on Claude Bernard.
- Dr. William S. Middleton, Madison, Wis., Medicine at Valley Forge.
- Dr. Thomas B. Hall, Kansas City, Mo., Dr. John Sappington and His Treatment of Fevers of the Missouri Valley.
- Dr. Parke H. Woodard, Lawrence, Kan., History of the Changing Ideas of the Nerve Impulse.
- Dr. Richard M. Burke, Clinton, Okla., Significant Dates in the History of Tuberculosis.
- Kenneth L. Mahony, Ph.D., Kansas City, Mo., Early History of Bacteriology in the Missouri Valley.

Following the annual banquet at the University Club Dr. Ralph H. Major, Kansas City, Mo., will discuss "A Visit to the Island of Cos." Among the exhibitors will be Dr. Matthew W. Pickard, Kansas City, Mo., Japanese netsukes of medical interest; Dr. Edward H. Hashinger, Kansas City, Mo., early nursing bottles and pap dishes; Dr. William M. Mills, Topeka, apothecary jars, and Dr. Logan Clendening, Kansas City, Mo., early American medical journals, William Harvey and Robert Boyle.

CORRECTION

Baccalaureate Degrees at Columbia.—In the Educational Number of THE JOURNAL, August 30, page 699, it was stated in listing the medical schools in the United States and Canada that the school of the United States having the fewest graduates with college degrees was Columbia University and that only 4 of the 104 graduates in 1941 had baccalaureate degrees. This was an error, and the opposite is true; that is, of the 104 graduates, only 4 did not have baccalaureate degrees.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 30, 1941.

Civilian Casualties in Air Raids

The following are the figures for the civilian casualties in air raids during the ten months since intensive bombing of this country started:

	Killed	Injured So Much as to Be Detained in Hospital
Sept.-Dec., 1940	21,669	30,556
1941 January	1,502	2,012
February	789	1,068
March	4,259	4,794
April	6,065	6,920
May	5,394	5,181
June	399	461
Total	40,077	50,992

Polish Medical Journal Continues Publication in London

The exiled Poles have their own army in Britain, and they also have, as previously stated in *THE JOURNAL*, a medical school directed by their own professors, at Edinburgh. They are now publishing in London the *Lokarz Wojskowy*, the journal of the Polish Army Medical Corps. In the latest issue is a review of the treatment of wounds by Colonel Sokolowski and a discussion of the problems of medical service in warfare by Lieutenant Kwoczynski. There are summaries in English of the more important articles.

Raid Demonstration for American Physicians

A realistic demonstration, which included the explosion of a "bomb," was carried out by Mr. G. H. MacNab, surgeon in charge of air raid casualties at Westminster Hospital, for the benefit of American physicians now in London. Having seen the "explosion" in a neighboring street, the physicians arrived at Westminster Hospital in time to hear the alarm and see a quick transformation from routine to air casualty practice within the building. The wards chosen for the demonstration were put out of action three months ago by a heavy explosion but are now ready again for service. The method of handling cases of shock and severe wounds was demonstrated by sisters and nurses who have handled hundreds of real cases. The method of giving blood transfusions was demonstrated by Mr. Ferguson.

The demonstration was watched by Dr. E. Harvey Cushing, who will report through his chief to the National Research Council, and Dr. Hugh Smith of the Rockefeller Foundation. Among the stretcher bearers, under the direction of Mr. Hickley, dental surgeon, were two who recently received the British Empire Medal for valor in their dangerous work.

American Aid for Wartime Nurseries

Queen Mary has become patron of a scheme to increase the number of wartime nurseries for which the Save the Children Federation of the United States has undertaken to provide the money. The invitation was conveyed to the queen by ex-Senator Hervey J. Allen, former governor of Kansas, who came to this country as a special representative of the federation, which is the parallel organization in the United States of the 22 year old Save the Children Fund of this country. He has visited several of the eight residential nurseries set up by the fund and the thirty daytime nurseries which have been established or are being aided by the fund, largely with American help. He is returning to America with plans for increasing the federation's help to provide some of the additional nurseries required by the need for evacuating more children from the great cities and for providing care for others whose mothers are being asked to undertake war work.

Economy in the Use of Liver Extracts

Under the defense regulations the Ministry of Health has issued an order limiting the use of liver extracts. This provides that the extracts shall be administered only to those suffering from pernicious or other megalocytic anemia and that the administration shall be only by injection. Until now liver for medicinal purposes has been imported, home supplies being used for food. This has meant the use of shipping refrigeration space which is urgently required for other purposes. Moreover, the preparation of extracts of liver to be taken by mouth involves the use of glycerin and alcohol, among other substances, for which there is an immense demand for munitions. Fortunately economy in the use of liver extract is possible without any hardships to patients. Liver extract is a specific only in the treatment of pernicious and other megalocytic anemia, and injection has proved much the most effective and economical way of administration. It has not, however, the same specific effect on the other and more common anemias which can be effectively treated in other ways.

The Bread Controversy

As previous letters to *THE JOURNAL* show, the question of white versus wholemeal bread is a subject of perpetual controversy. The trouble arose in the nineteenth century when steel rollers were introduced for the grinding of flour and removed the whole of the wheat germ and the inner husk, depriving the flour of valuable vitamins and mineral substances. This was long before the discovery of vitamins and dietitians were not alive to the evils of this loss. But recently, and especially since the war has led to greater attention to diet, the importance of wholemeal bread has been appreciated. As stated in previous letters, the government, under the advice of the Medical Research Council, has ordered the production of a loaf of 85 per cent extraction instead of the usual 73 per cent. This was done in order to secure as much as possible of the B vitamins and of the protein, including that situated in the outer layers of the grain, which has higher value than that contained in white flour. As little bran as possible was aimed at, so as to avoid loss of nutritive value due to the presence of indigestible material. Wartime diets already contain much vegetable food with large amounts of roughage, which it is undesirable to increase.

Another recommendation of the Medical Research Council, accepted by the government, is the addition of vitamin B₁ and calcium salts to white flour. The council says that the intake of calcium salts from our diets, especially among the poor, is frequently below the necessary minimum for satisfactory growth of bones and teeth in children and the maintenance of bones in adults. It therefore recommends the addition of calcium carbonate to the flour used for making bread. Seven ounces should be added to the 280 pound sack of white flour and 14 ounces to the sack of 85 per cent extraction flour. The reason for the greater quantity in the latter case is that it is necessary to neutralize the extra phytic acid in flour of this degree of extraction.

These regulations have given rise to some criticism. The Cheshire Local Medical Committee points out that the 85 per cent flour is produced by two processes, one requiring a rearrangement of the milling machinery, the other an admittedly inferior method, the addition to white flour of "combinations and other fractions." This product is unreliable but allowable pending an alteration in the machinery. The Cheshire committee urges that 100 per cent wheatmeal, with neither addition nor subtraction, should be produced and used for the making of bread. As to the addition of calcium to white flour, the committee says that, once flour is fragmented and deprived of this or that fraction, the balance of its nutrients is disturbed and an addition of chalk brings in new problems. It points out the richness of wholemeal in minerals which are found just inside the groove in the wheat berry. With stone milling

these minerals were ground up with the rest of the flour, but modern milling is designed "to break the staff." The committee throws at the minister of food a quotation from Leviticus: "When I break the staff of your bread . . . ye shall eat and not be satisfied." The trouble seems to be that expensive machinery for the degradation of wheatmeal is installed in all the mills and difficult to alter. The millers say that the public prefers white bread. A large part of the people certainly do, but the propaganda of the Ministry of Health and of eminent physicians is enlightening them and the bread of 85 per cent extraction is rapidly becoming more popular.

PALESTINE

(From a Special Correspondent)

Aug. 15, 1941.

Meeting of the Jewish Medical Association

From March 19 to March 23 the twelfth scientific physicians' meeting of the Jewish Medical Association of Palestine took place in the Strauss Health Center in Tel-Aviv, attended by about four hundred physicians. The main subject was the problems of anemia. The papers of S. G. Zondek and G. Brückmann of Tel-Aviv on the biochemistry of heavy metals (iron, copper and manganese) were especially noteworthy. In these contributions it was stated that extensive iron analyses of many human organs have been made in order to get more detailed information about the distribution of iron in its various forms within the body. In an adult man weighing 65 Kg., with a total blood volume of 5.3 liters, there is present approximately 4 Gm. of iron, about 3 Gm. of which is in the form of hemoglobin (2.7 Gm. in the blood, 0.3 Gm. in the muscles) and 1 Gm. in the form of nonhematin iron. From the latter fraction only 0.5 to 0.6 Gm. can serve as reserve iron for the formation of new hemoglobin, whereas the remaining 0.4 to 0.5 Gm. represents the so-called parenchyma iron, which cannot be drawn on even in the case of urgent need for hemoglobin. The function and chemical nature of this fraction, which is present in similar concentration in all human and animal tissues, is as yet entirely obscure and invites further investigation.

The amount of heme compounds other than hemoglobin, chiefly cytochrome, is estimated to be from 10 to 20 mg. in the whole body. It is evident from this balance that only a fourth to a fifth of the total blood hemoglobin is replaceable from the body's own iron reserves, a fact which explains the predominant role of blood loss in the etiology of iron deficiency anemias. Typical life curves for the nonhematin iron content of various organs have been obtained (in man and animals), which seem to be related to the polycythemia of the newborn and the "physiologic anemia" of young growing children and animals. As to the latter, a number of arguments can be raised against the frequently expressed view that it is due to iron deficiency. It must be admitted, however, that in young children the ratio hemoglobin iron: reserve iron is even more unfavorable than in adults; thus the physiologic anemia of this age changes easily into the true pathologic anemia, which, in the form of nutritional anemia of infancy, is so familiar to the pediatrician.

A typical life curve also exists for the copper content of liver, which is very high at birth. This "congenital copper deposit" is usually believed to be connected with the well known function of copper as a catalyst in the synthesis of hemoglobin. More detailed comparative studies in some animal species, however, suggest rather a connection with growth and development, since the copper curves in various species seem to be shifted in the direction of the later development. The phenomenon is still under investigation.

Dr. E. G. Joseph of Jerusalem reported in his paper that peritonitis can often be prevented by introducing the blood of the patient into the peritoneal cavity. Joseph's observations were made when treating patients with abdominal wounds during the

disturbances of the years 1936-1938. When copious hemorrhage accompanied wounds of the intestine, healing occurred more promptly in cases in which bleeding followed into the peritoneum. Therefore, before closing the peritoneum when operating on perforated ventricular or duodenal ulcer, Joseph put about 200 cc. of the patient's own blood into the peritoneum and thus warded off peritonitis as well as adhesions (a result obtained also in animal experiments).

Papers were read also by Prof. S. Adler of Jerusalem on the centenary of the discovery of the trypanosomes, by Dr. Michaelson of the British army medical service on the coincidence of ophthalmoscopy and pathology and by Prof. Bernhard Zondek of Jerusalem on investigations of the relations between sex hormones and genital tumors.

The closing session was attended by the former Polish prime minister General Slawoj-Skladkowski and other Polish as well as British army physicians and British and Arab civilian doctors from all parts of the country.

Bernhard Zondek's Fiftieth Birthday

The fiftieth birthday of Bernhard Zondek was celebrated on July 29. In the time which the ordinary undergraduate devotes to leisure, Zondek had already written and published fifteen scientific papers. At the age of 32 he became professor and as early as three years later he was admitted to the board of professors of the Berlin Medical Association. In 1925 he started experimentally as well as clinically his systematic hormone research, which was to become so well known all over the world. In cooperation with several other workers he continued a series of important experiments with the implantation of hypophyseal glands into rats. The pains he took with this difficult work were rewarded by the discovery of the gonadotropic hormone. As director of the gynecologic and obstetric department of the Municipality Hospital in Berlin-Spandau he had the opportunity of applying the results yielded by animal experiment to the human organism. It was during this period of research that the Aschheim-Zondek test of pregnancy was elaborated—the determination of gonadotropic substance in the urine of pregnant women. The isolation of this principle culminated in its therapeutic use, though both the history of its discovery and the work of its discoverer are seldom thought of today.

Marriages

ORIN LEONARD DAVIDSON JR., Springfield, Mo., to Miss Julia Norris Harrison of Tampa, Fla., June 28.

DON PRESTON PETERS JR., Lynchburg, Va., to Miss Betty Sowards of Lexington, Ky., August 6.

GEORGE ROGERSON WOLTMANN, Chicago, to Miss Betty Thomas of Urbana, August 2.

GORDON KENNETH LAMBERT, New York, to Miss Mary Ellen Kelly of Brooklyn, August 5.

SAMUEL MORRISON, Baltimore, to Miss Mary Jane Selser of Mercersburg, Pa., July 18.

CLAIRE H. MITCHELL, Indianapolis, Iowa, to Miss Beulah Shinn of Neenah, Wis., August 7.

ROY G. KLOCKSIEN, Newton, Iowa, to Miss Lucille Sheppard of Des Moines, July 19.

JOSEPH F. BEER, Detroit, to Miss June C. Renaud of Grosse Point, Mich., in June.

ROBERT HOWELL BOSSERT, Burbank, Calif., to Miss Lois Ruth Benjamin, August 2.

PHILIP HENRY BEST, Paris, Ill., to Miss Ruth Moritz of Effingham, June 28.

EDWARD BLANK, Concord, N. H., to Miss Ulla Gans of New York, August 4.

JOHN L. DIES to Mrs. Mildred Delk, both of Memphis, Tenn., July 13.

PAUL GROSSBARD to Miss Lillian Markowitz, both of Brooklyn, June 11.

Deaths

Dean DeWitt Lewis ☉ President of the American Medical Association, 1933-1934, died at his home in Baltimore, October 9, following an illness of some three years subsequent to cerebral vascular changes.

Dr. Dean Lewis was born in Kewanee, Ill., Aug. 11, 1874. He received his A.B. degree from Lake Forest University, 1895, and his M.D. degree from Rush Medical College, 1899. Early he became associated in a teaching position with his alma mater, serving as assistant in anatomy, 1900-1901, and associate, 1901-1903. He then taught surgery as an instructor, 1903-1919. He was associate professor of surgery, 1919-1920, and professor, 1920-1924. In 1924, he received invitations to the chair of surgery in several medical schools and finally accepted the professorship in surgery at the University of Illinois College of Medicine, which position he filled from January to July 1925. Then he accepted the professorship of surgery in Johns Hopkins University School of Medicine and became surgeon in chief of the Johns Hopkins Hospital. About three years ago, following an educational and lecture trip to the West, he suffered apparently a vascular disturbance of the brain. In April 1939 he resigned the professorship of surgery and became professor emeritus.

Early in his medical career, Dr. Lewis began investigations in the field of anatomy and microscopic anatomy. While working with Bensley at the University of Chicago, he became interested in vital staining of tissue and reported the microscopic changes and hyperplasia of the chromophile cells in the anterior lobe of the hypophysis of a patient with acromegaly. Later he continued investigation under Spalteholz in Leipzig and reported on the fascia of the kidney. His many contributions to medical literature include papers on the ductless glands, transplantation of tissue, bone tumors and neurosurgery. He was editor, from the time of its foundation, of the system of Practice of Surgery, published by the W. F. Prior Company, and also served as editor of *International Surgical Digest*. Noteworthy also was his first clinical use of ethylene as an anesthetic, reported by him and Dr. Arno B. Luckhardt in December 1923.

In World War I, he was commissioned as a major in the Medical Corps. In 1917, he organized Base Hospital No. 13 at the Presbyterian Hospital in Chicago. This unit sailed for France in May. Later, he was head of a surgical team working with Evacuation Hospital No. 7, and still later with two other evacuation hospitals in Chateau Thierry. After the armistice, he was promoted to the rank of lieutenant colonel and had a large service concerned with the treatment of nerve injuries and reconstructive surgery. He was also awarded the Distinguished Service Medal for his services during the war. He gave of his services to the veterans of the World War as a member of the Council of the United States Veterans' Bureau.

In 1920, Dean Lewis accepted the editorship of the *Archives of Surgery* and continued his service to the publication until incapacitated by illness, at which time Dr. Walman Walters undertook editorial supervision. In the American Medical Association, Dr. Lewis served as a member of the House of

Delegates, representing the Section on Surgery, General and Abdominal, 1915, 1916 and 1917. He was secretary of the Section on Surgery, General and Abdominal, 1912-1913, and chairman, 1919-1920. In 1931 he became a member of the Council on Medical Education and Hospitals, resigning from that position when he was elected to the presidency in 1933. He also represented the American Medical Association in the Committee on Autopsies of the American Hospital Association.

Among other organizations, he was a member of the American Surgical Association, the American Association of Anatomists, the American Physiological Society, the American Society of Clinical Surgery, the Interurban Surgical Society, the Southern Surgical Association, the Western Surgical Association, the Royal College of Surgeons of Ireland, the Royal Australian College of Surgeons, the Società Medico-Chirurgica of Bologna, was an Ausserordentliches Mitglied der

deutschen Gesellschaft für Chirurgie and also a foreign member-correspondent of the Société des Chirurgiens de Paris. He was made an honorary doctor of science by the National University of Ireland at Dublin in 1933. In 1932, his portrait was presented to Johns Hopkins University, the presentation address being given by Prof. J. M. T. Finney.

Perhaps no other American surgeon has been as widely in demand as a teacher of practitioners as was Dr. Dean Lewis. He was in constant demand throughout the nation as a speaker before medical organizations, and he gave liberally of his energy and of his time to this service. His genial character made for him a tremendous number of friends and admirers and is well described in the following phrase from a biographic note prepared by Dr. Vernon C. David: "A host of friends who know the greatness of his soul, his loyalty, his matchless spirit, his love of sports, his great ability as a surgeon and his comradeship."

Frank Burr Mallory ☉ Boston; Harvard Medical School, Boston, 1890; assistant in histology, 1890-1891, assistant in pathologic anatomy, 1891-1892, assistant in pathology, 1892-1893, instructor of pathology from 1894 to 1896, assistant professor from 1896 to 1901, associate professor from 1901 to 1919, professor of pathology from 1928 to 1932 and since 1932 professor

of pathology emeritus at his alma mater; member, past president and treasurer of the American Association of Pathologists and Bacteriologists; member of the Association of American Physicians; pathologist from 1897 to 1932 and since 1932 consulting pathologist, Boston City Hospital; in 1933 the Mallory Institute of Pathology of the Boston City Hospital was dedicated, honoring him for his association with the laboratory since 1891, when he was appointed assistant; editor in chief of the *Journal of Medical Research* in 1923, continuing in that capacity when its name was changed in 1925 to the *American Journal of Pathology*; author of "Principles of Pathologic Histology" published in 1914; co-author with Dr. J. Homer Wright of "Pathological Technique," first edition published in 1897 and eighth edition published in 1924; later editor of a revised "Pathological Technique" published in 1933; in 1928 received an honorary Sc.D. from Tufts College, Boston, and in 1932 Boston University conferred the same award on him; in 1935 was awarded the George M. Kober Medal for outstanding service in pathology by the Association of American Physicians, aged 78; died, September 27, of arteriosclerosis and bronchopneumonia.



DEAN DE WITT LEWIS, M.D., 1874-1941

Henry Thomas Kelly • White Plains, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1898; past president of the Medical Society of the County of Westchester; chief of staff of the White Plains Hospital; member of county board of appeals of the selective service; formerly member of the city board of health; was the first editor of the *Westchester Medical Bulletin* when it was established in April 1933 and continued as editor in chief until March 1937; since 1937 historian of the Medical Society of the County of Westchester; aged 66; died, September 8, of coronary thrombosis.

Elijah Hollingworth Siter, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1897; associate in genitourinary surgery at his alma mater, 1922-1923; fellow of the American College of Surgeons; served during the World War; on the staff of the Philadelphia General Hospital; served in various capacities on the staff of the Hospital of the University of Pennsylvania; aged 73; died, September 5, at York Harbor, Maine.

George Arthur Seybold • Jackson, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1904; fellow of the American College of Surgeons; past president of the Jackson County Medical Society; served during the World War; aged 59; surgeon and member of the staff of the Mercy Hospital and the W. A. Foote Memorial Hospital, where he died, September 6, of coronary thrombosis.

Aaron Samuel Green • San Francisco; Denver and Gross College of Medicine, 1908; member of the American Academy of Ophthalmology and Otolaryngology and the Pacific Coast Oto-Ophthalmological Society; fellow of the American College of Surgeons; part owner of an eye hospital bearing his name; aged 62; died, September 9, of cerebral hemorrhage while vacationing at White Sulphur Springs, W. Va.

Thomas Francis Lowe, Washington, D. C.; Georgetown University School of Medicine, Washington, 1902; member of the Medical Society of the District of Columbia; professor of anesthesia and professor of clinical obstetrics at his alma mater; on the staff of the Episcopal Eye, Ear and Throat Hospital; aged 61; died, September 13, of cirrhosis of the liver.

Jesse Le Van Wagner • Reading, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1906; member of the American Academy of Ophthalmology and Otolaryngology; served during the World War; for many years on the staff of the Reading Hospital; aged 57; died, September 4, of myocarditis and arteriosclerosis.

Hubert Messner Heitsch, Washington, D. C.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1922; formerly director of public health of the city of Pontiac, Mich.; acting assistant surgeon, United States Public Health Service; aged 47; died, September 17, in Hartford, Conn., of coronary occlusion.

Murray James McElwee, Brentwood, Pa.; University of Louisville (Ky.) School of Medicine, 1931; at one time chief of the tuberculosis division, department of health of Pennsylvania; aged 37; on the staff of the Veterans Administration Facility, Brecksville, Ohio, where he died, September 1, of acute appendicitis and pulmonary embolism.

William James Harrington, Dauphin, Man., Canada; Manitoba Medical College, Winnipeg, 1900; past president of the Council of the College of Physicians and Surgeons of Manitoba; aged 68; died, September 13, in the Winnipeg General Hospital during an operation for removal of the prostate gland.

Roger Williams Paul • Washington, D. C.; College of Medical Evangelists, Los Angeles, 1920; an Associate Fellow of the American Medical Association; at one time a medical missionary in China; on the staff of the Washington Sanitarium and Hospital; aged 51; died, August 29, of acute nephritis.

Arthur Henry Brumback, Chicago; College of Physicians and Surgeons of Chicago, 1884; member of the Illinois State Medical Society; at one time on the staff of the Westside Hospital; aged 79; died, September 10, in the Garfield Park Hospital of acute dilatation of the heart and cirrhosis of the liver.

Murdock Alexander Macaulay, Halifax, N. S., Canada; Halifax Medical College, 1904; member of the board of school commissioners; commanding officer of Camp Hill Hospital; district administrator for Nova Scotia and Prince Edward Island; served during the World War; aged 60; died, July 31.

George Patrick O'Malley • Cleveland; University of Wooster Medical Department, Cleveland, 1912; fellow of the American College of Surgeons; for many years police surgeon; served during the World War; on the staff of St. John's Hospital; aged 54; died, September 6, of coronary occlusion.

George Chester Ryan, Maquoketa, Iowa; State University of Iowa College of Medicine, Iowa City, 1920; member of the Iowa State Medical Society; secretary of the Jackson County Medical Society; aged 46; died, September 2, at Rochester, Minn., of meningitis and carcinoma of the left nostril.

Frank Ellsworth Stone, Lynn, Mass.; Medical School of Maine, Portland, 1885; member of the Massachusetts Medical Society; on the staffs of the Lynn and Union hospitals; aged 79; died, September 3, at the Benjamin Stickney Gable Memorial Hospital, Ipswich, of coronary occlusion.

James Black Merritt III, Easton, Md.; Baltimore Medical College, 1907; member of the Medical and Chirurgical Faculty of Maryland; past president of the Talbot County Medical Society; on the staff of the Emergency Hospital; aged 58; died, September 3, of coronary thrombosis.

William H. Eastman, Fredericktown, Ohio; Starling Medical College, Columbus, 1892; member of the Ohio State Medical Association; past president of the Knox County Medical Society; member of the county board of health; aged 78; died, September 2, of cerebral hemorrhage.

Milton Finney Smith • Shreveport, La.; University of Virginia Department of Medicine, Charlottesville, 1896; at one time city physician and member of the city board of health; formerly on the staff of the Charity Hospital; aged 68; died, September 7, of pulmonary tuberculosis.

John Alonzo Beek, Gloucester City, N. J.; Jefferson Medical College of Philadelphia, 1901; city health officer; served at various times as a member of the board of education, medical officer of the schools and a member of the state board of health; aged 73; died, September 7.

James Robert Plummer, Forest, Miss. (licensed in Mississippi in 1910); member of the Mississippi State Medical Association; served during the World War; examiner for the local draft board; aged 57; died, September 6, in the Baptist Hospital, Jackson, of heart disease.

Henry Stanley Kerchner • Ambridge, Pa.; Jefferson Medical College of Philadelphia, 1915; served during the World War; fellow of the American College of Surgeons; on the staff of the Valley Hospital, Sewickley; aged 51; died, September 6, of coronary occlusion.

Lester Edgar Schoch, Elysburg, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1888; member of the Medical Society of the State of Pennsylvania; aged 77; died, September 7, in the Geisinger Hospital, Danville, of coronary thrombosis.

Vincent J. McAuliffe • Huntington, N. Y.; Baylor University College of Medicine, Dallas, Texas, 1921; on the staff of the Huntington Hospital; surgeon for the city health department; aged 49; died, September 8, in the New York Hospital of heart disease.

Donald Robert Claydon, Red Wing, Minn.; University of Louisville (Ky.) School of Medicine, 1926; member of the Minnesota State Medical Association; aged 38; died, August 28, in Rochester, Minn., of injuries received in an automobile accident.

Glenn Waldo Smith, Warwick, N. Y.; University and Bellevue Hospital Medical College, New York, 1927; member of the Medical Society of the State of New York; aged 44; died, September 4, of injuries received in an automobile accident.

Frederick Eugene Roper, Norwich, N. Y.; Homeopathic Hospital College, Cleveland, 1888; member of the Medical Society of the State of New York; aged 77; on the staff of the Chenango Memorial Hospital, where he died, September 8.

Thomas Francis Rearden, New Rochelle, N. Y.; University of Vermont College of Medicine, Burlington, 1894; for many years chairman of the city board of health of Springfield, Mass.; aged 69; died, September 5, of coronary thrombosis.

Charles Augustus Poellnitz, Greensboro, Ala.; Medical Department of Tulane University of Louisiana, New Orleans, 1901; member of the Medical Association of the State of Alabama; aged 64; died, September 4, at Monteagle, Tenn.

Howard Van Locke • Orbisonia, Pa.; Medico-Chirurgical College of Philadelphia, 1911; medical examiner for the county draft board; for many years member of the school board; aged 54; died, September 10, of cerebral hemorrhage.

Bureau of Investigation

A NOSTRUM ADVERTISEMENT FOLLOW-UP

A Chicago newspaper has recently carried an advertisement for a "pile remedy" put out by the Acme Ointment Company, using a postoffice box number in Chicago. Those who answered this advertisement received in the mail a small box of ointment labeled with a complete formula. This formula exceeds even the requirements of the provisions of the Food, Drug and Cosmetic Act by giving the quantity of each active ingredient. The label contains, presumably in anticipation of enforcement of another provision of the law, the legend "Caution: To be used

only by or on prescription and direction of a Physician." Contrarily, the package includes also a page giving "Directions for Applying" in self treatment, but with a disclaimer that if the treatment is not successful "a qualified doctor should be consulted." This would seem to be a bit unusual for a "patent medicine" which is advertised directly to the public in a daily newspaper. Apparently the physician is brought largely into the picture. Since presumably, once the patient is in the hands of the physician, the preparation would be replaced by other forms of treatment, subsequent orders resulting from the use of the sample are apt to be few.

But wait! A few days after (and in one case a few days before) the person receives the sample a letter arrives from the Allied Physicians (Clifford White, M.D.—Paul Sinclair, D.O.)

If you are troubled with
HEMORRHOIDS
that bleed or protrude, write today for generous Free Pile Treatment.
ACME OINTMENT CO.
P. O. Box 56 Dept. R Chicago

Advertisement from a Chicago newspaper.

What Few People Know

ACME PILE OINTMENT
Stramonium, Ichthammol, Witch Hazel, Oculia Acid, Benz. Balaustate, Formin, Dioxid & Bullur, Eux (for new remedy)

Each Tube contains:
Lotion (Balsam) — 1 gm. Ichthammol — 1 gm.
Lotion (Balsam) — 1 gm. Formin — 1 gm.
Lotion (Balsam) — 1 gm. Dioxid — 1 gm.
Lotion (Balsam) — 1 gm. Bullur — 1 gm.
CAUTION: To be used only by or on prescription and direction of a Physician.
For external use only. Key to each tube

ACME OINTMENT CO.

A SPECIAL OFFER TO YOU -
If you will bring this card to our office between now and Sept 9, 41 and not after 5 p. m., you will receive a free examination and a trial treatment which will give you the information as to what you are suffering from and will enable you to know how painless and how effective our treatment really is. No obligation whatsoever. Just bring along this card.

ALLIED PHYSICIANS
1602 Rectal Diseases and Varicose Veins
SUITE 1805 HALLERS BLDG
940 WABASH AVENUE
CHICAGO ILLINOIS

ALLIED PHYSICIANS
5 SOUTH WABASH AVENUE
TELEPHONE: STATE 3222
CHICAGO - ILLINOIS

Part of material received by those who answered advertisement.

of 5 North Wabash Avenue, Chicago. This mailing contains the statement "We understand that you are suffering from a rectal ailment and that you realize that these conditions do not get well by themselves. . . . We are rectal specialists and

are writing you from an experience extending over many years. . . . What you really need is the specific information which relates directly to your own individual ailment and symptoms. . . . We therefore cordially invite you to call at our office." Also included in the letter is a dated appointment card labeled "A Special Offer to You" and a booklet by the Allied Physicians entitled "What Few People Know," dealing with various rectal conditions and lauding their treatment of hemorrhoids while deriding hemorrhoidectomy.

Can it be that the Acme Ointment Company is serving as a means of contacting patients for the Allied Physicians? Possibly the Allied Physicians are merely buying the customer list of the Acme Ointment Company. However, the follow-up is exceedingly rapid.

The booklet "What Few People Know" is, of course, merely a piece of direct advertising to the public. It states that Dr. Clifford White is a "graduate in medicine and surgery, Dalhousie University, Canada. Licensed to practice in Illinois, Iowa and Canada." Needless to say, he is neither a Fellow nor a member of the American Medical Association. The booklet also states that "Dr." Paul Sinclair is a graduate of the American School of Osteopathy, licensed to practice in Illinois, Missouri, Nebraska and Texas.

On just what basis White and Sinclair claim to be "rectal specialists" is not apparent from the information available.

The use of a nostrum "come-on" as a procurer for a practice of medicine constitutes a new low of some kind, probably the lowest possible form of unethical medical practice.

THE LAW AND THE QUACK

Recently a physician received a letter from a New York physician reading as follows:

I have a number of patients living in and around . . . who have taken certain tablets from me for the reduction of weight.

As I no longer dispense them direct, your name was suggested to me to whom I could recommend my patients so that they could continue this treatment under your direction.

For your information I wish to state that the chief ingredient in these tablets is Thyroid substance. My patients are started on a dosage of 1¼ grs. of Desiccated Thyroid combined with a small amount of Sodium Iodide and Pulv. Digitalis three times daily. This dosage is exceedingly well tolerated. A laxative tablet is given with this. Depending upon the reaction and results, the dosage is increased to 1¾, 2½ and 3 grs. per tablet. The patient must stay on the one formula for not less than one month.

Prolonged administration of these tablets in over one hundred thousand cases has proved them to be not only very effective and harmless in weight reduction but in relieving the symptoms of this and other metabolic disturbances.

The minimum price my patients pay is \$3.50 for a month's treatment. The price to you will be \$1.50 for a month's supply of both kinds of tablets, the reducing and the laxative.

Should you care to handle these tablets for me I shall be pleased to send such other patients as I may have in your vicinity, to you. I am quite confident that when you become familiar with the merits of these tablets you will have no hesitation to use them in your practice.

I shall be pleased to give you any additional information you may require to obtain the best results from the use of these tablets.

Hoping to hear from you at an early date and assuring you of very good results both medical and financial, I am

Very truly yours,
Dr. R. Newman

The communication is amusing. Why should the physician addressed employ the particular remedy when the essential features of the medicine are given in full detail? Fee splitting on a nostrum is apparently a unique practice. What, then, is the probable reason for this method of approach by Newman? This Bureau published a pamphlet entitled "Obesity Cures" in 1929. One article therein contained reference to the Newman "obesity cure." Reproduced herewith is a cut appearing in the pamphlet, which is an old advertisement for this method of reducing. Note the phrase in the old advertisement, "No dieting, no exercise, absolutely safe and sure method," and the sentence in the letter quoted to the effect that prolonged administration has proved the remedy harmless.

Newman at one time used the free trial method of introducing his remedy to the public and the usual follow-up system on failure to take in the individual with the free offer. The only point of interest here is the probable reason for this new method of approach to the patient through his local physician.

The Food, Drug and Cosmetic Act of 1938 contains, in section 502, regulations concerning the labeling of drugs that are promoted to or sold directly to the public. This section is followed by section 503, designating certain exemptions from the regulations of 502. Paragraph *b* of 503 reads:

A drug dispensed on a written prescription signed by a physician, dentist, or veterinarian (except a drug dispensed in the course of the conduct of a business of dispensing drugs pursuant to diagnosis by mail) shall if—

- (1) such physician, dentist or veterinarian is licensed by law to administer such drug, and
- (2) such drug bears a label containing the name and place of business of the dispenser, the serial number and date of such prescription, and the name of such physician, dentist or veterinarian, be exempt from the requirements of section 502 (*b*) [identification of manufacturer and distributor] and (*c*) [the common name of the drug and the declaration of the quantities of certain specified drugs, including thyroid], and (in case such prescription is marked by the writer thereof as not refillable or its refilling is prohibited by law) of section 502 (*d*) [the declaration—"May be habit forming"].

The important clause in this instance would seem to be the parenthetical one in section *b*. This Bureau has commented before on the effect of this parenthetical phrase in connection with the promotion of mail order treatments.¹ The most important feature is, of course, the fact that these promoters are not exempt from section *c*, which results in identification of the drugs contained in the nostrum and therefore makes such statements as "absolutely safe" a little ludicrous.

It seems reasonable to predict that if mail order concerns must, of necessity, as in the case cited here, employ the services

tered in the form of tea, as constituting cures or remedies for, or as possessing therapeutic value in the treatment of, cancer, tuberculosis, ulcers and numerous other diseases and disorders."

According to further findings, the Commission said, "Fong Poy's methods of diagnosis are based upon doctrines which are of historical interest only, and which have had no acceptability in the scientific sense for several centuries. One such doctrine involves analogy between color of plant preparations and color of organs of the body or color of symptoms that may occur in the body." Further evidence was presented to show that Fong Poy is not a physician and has had no formal medical or scientific training, and that "it is impossible correctly to diagnose human ailments or disorders through the method employed by the respondents." Among the numerous conditions that the herbs were represented to cure or benefit were cancer, tuberculosis, diabetes, Bright's disease, paralysis, arteriosclerosis, cross eyes, gallstones, pyorrhea, obesity and stomach ulcers, as well as disorders of the heart, kidney, bladder, blood, liver, bronchial tree and stomach.

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," cosmetics or medical devices have agreed with the Federal Trade Commission to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Long-Life Health Brace.—This device is put out by the Ohio Trust Company, Cincinnati, which in February 1940 promised the Federal Trade Commission that it would "cease labelling or otherwise designating a shoulder brace or similar product offered for sale as 'Long Life Health Brace,' or cease representing in any other way that the user may expect thereby to attain health and other desirable conditions, or that such results are to be obtained through correct breathing or erect posture, in and of themselves."

McCoy's Little Tablets.—These are put out by Paul V. McCoy and L. E. Goursmen, of Santa Ana, Calif., trading as McCoy Drug Company. In August 1940 these persons promised the Federal Trade Commission to discontinue certain misrepresentations in the sale of the tablets. Among these were that the use of their product will correct the elimination of any organ or will effect other than temporary relief from constipation; or that when constipation is overcome through use of their product, it ends, or often ends, nine tenths or any other specified numerical estimate of other ailments with which a sufferer may be afflicted when in fact such claim is not based on statistical or other competent evidence. McCoy and Goursmen further promised to cease representing that their product does not contain harsh laxatives or ingredients that depend on irritating the bowels for their effect, or that it will act as a tonic for every part of the digestive tract or will sweeten the stomach.

Packer's Scalptone.—According to a report issued by the Maine State Bureau of Health in February 1935, the chief ingredients of this are salicylic acid and quinine hydrochloride, with a very small amount of capsaicin (red pepper). These drugs are intended to stimulate the scalp surface and, in general, are harmless. They do, however, prove irritating to some scalps and there have been reports that some persons suffered untoward reactions following the use of "Scalptone." In February 1940 Packer's Tar Soap, Inc., New York, promised the Federal Trade Commission to cease representing in its advertising of Scalptone "that all dandruff is due or usually due to an infection with *Pityrosporum ovale* or any other organism, that the respondent's product, used either alone or in combination with any other products, will eradicate, prevent, cure or rid the scalp of dandruff permanently, arrest falling of hair or increase its growth, except when limited to such results as may be achieved by its action in cleansing the scalp and stimulating the circulation of the hair follicles, that 'Scalptone' disinfects the scalp and constitutes a complete treatment, that experts generally are of the opinion that baldness is due to wetting of the hair, that dandruff is generally the cause of baldness, or that any organism is recognized as 'the dandruff germ'."

Sinus-Aid.—This is put out by E. A. Hartman, Ezra Hartman and R. J. Jeffries, trading as Neah Laboratories, Fort Wayne, Ind. In August 1940 these persons stipulated with the Federal Trade Commission that they would discontinue certain misrepresentations in the sale of "Sinus Aid." Among these were that the product affords a new or effective method for treating sinus infections, colds, asthma, hay fever or other disturbances of the respiratory tract or that the fumes of their preparation are effective without carrying the infection to other parts of the respiratory tract.



Get Rid of Your FAT

Free Trial Treatment

Sent on request. Ask for my "pay-when-reduced" offer. I have successfully reduced thousands of persons, often at the rate of a pound a day, without diet or exercise. Let me send you proof at my expense.

DR. R. NEWMAN, Licensed Physician,
State of New York, 286 Fifth Ave., N. Y., Desk W

One of Newman's old advertisements

of a local physician in order to continue their activities and must, in order to obtain such cooperation, disclose the entire formula of the preparation, as is done in this case, they are definitely on their way out. Efforts like the letter quoted constitute a last gasp!

NEVER THE TWAIN SHALL MEET

Ancient and Dilapidated Eastern Remedies Encounter Western Law and Science

In this department of THE JOURNAL, June 6, 1931, page 1974, there appeared an abstract of a fraud order issued against the Fong Wan Herb Company, a mail order scheme run by one Fong Wan at Oakland, Calif. In the same department on Nov. 2, 1940, pages 1566-1567, appeared an article reviewing the fraud order and reporting a complaint which the Federal Trade Commission had brought against Fong Wan on Dec. 14, 1939. The article closed with the statement "In the meantime, it will be interesting to note the outcome of the Federal Trade Commission case."

On June 1, 1941, the Commission announced that it had "ordered Fong Poy, also known as Fong Wan, a distributor of Chinese herbs, 576 Tenth Street, Oakland, Calif., and his copartners, Fong Kwongii, Yee Nun Yet, Chan Woon Sheung and Lee Bing Lim, individually and trading as Fong Wan, to cease and desist from misrepresentations in the sale of their herbs." The Commission reported that according to some of its findings "the respondents have advertised Fong Poy as being qualified to diagnose diseases, and their herbs, when adminis-

1. Tucker's Specific for Asthma Cries Help! J. A. M. A. 111:2229 (Dec. 10) 1938

Correspondence

"THERE IS NOTHING PHYSICALLY THE MATTER"

To the Editor:—The examination has been thorough and included many laboratory tests in addition to the usual clinical procedures. The physician then gives the patient the diagnosis and prescription for which he has been consulted. "There is nothing physically the matter with you—nothing that a good vacation could not cure. Stop worrying, snap out of it, pull yourself together!"

The immediate effect is deceiving; the patient may feel relieved that he has not an obscure and devastating disease, but the reaction is prompt and often overwhelming. "If the doctor had found something the matter I could be treated by drugs or surgery—what hope have I now?" the patient asks of himself. The suffering patient alone realizes the extent of his misery, which has not been dissipated by the physician's kind attitude, cheerful words or reassurances. Admonitions to forget are hollowly received, for the patient knows he does not want to be sick, had no volition in the process and knows not how it came about. How then can he decide not to be ill and "snap out of it"? The inevitable result is greater depression now attached to an apparently realistic concept that the doctors do not know what is the matter with him or how to treat him. Then suicidal ideas may become more urgent, closer to action or be carried out, and one more life which could have been saved has been lost. That is the stimulus for this communication.

If there is nothing physically the matter, what is wrong? The patient suffers from a psychologic disturbance manifested by anxiety, depression, phobias, compulsions or other symptoms of processes which are illnesses as intense and disabling as any physical disease. Such disturbances are as little the result of voluntary processes or conscious intent as pulmonary tuberculosis, carcinoma or heart disease and equally amenable to the magic of kind words or admonitions. For psychologic illness as for physical diseases there are also rational therapies adapted to amelioration or cure. It is unimportant to indicate what these may be—there are many and each has its indications and contraindications. There is no single method for treating psychologic illness, and there is as little gained in discussing them under the one rubric "psychotherapy" as to talk about "medical therapy." Of greater importance is the necessity for medical men to recognize that associated with the negative aspects of physical disease are positive aspects of psychologic illness which can be elicited by competent psychiatrists and appropriate therapy designated. Why is there such resistance to this recognition by the medical profession? Whatever the reasons may be, the unimproved condition of these patients, their progressive deterioration and often suicide do not further the repute of scientific medicine.

ROY R. GRINKER, M.D., Chicago.

SURGICAL RECORDS

To the Editor:—Few surgeons appreciate how important it is that a complete record be made of various operative procedures. It is not sufficient to say that cholecystectomy or hysterectomy or appendectomy or what not "was carried out in the usual manner." Such short cuts are definitely out of order if the patient and the physician next seeing the patient are to be given consideration. It is important to know how much of the cystic duct was left intact and whether the remnant of the cystic duct was examined for the presence of calculi. It is important to know at what level supravaginal hysterectomy was done. It is important to know in what manner amputation of

the appendix was carried out, how much of the stump remained and whether or not the stump was buried. On the surface, such matters seem trifling, but several cases of gangrenous appendicitis with perforation have been encountered following what amounted to a subtotal appendectomy done elsewhere. Low amputation, leaving a minimum of tissue distal to the ligature and burying the stump beneath a purse-string suture of medium silk placed widely about the base of the appendix seems to offer the best insurance against such a misfortune. Every surgeon has been confronted by the patient presenting the physical signs and some or all of the subjective symptoms of appendicitis but who has already had an appendectomy. If such a patient had a complete record of the operation available, the examiner could more readily arrive at the correct diagnosis.

A corrective step would be to have every operator dictate his own note in full shortly after the completion of the operation. This is done in several of the better clinics, but there are still many hospitals in which the first assistant, who cannot possibly gain as full and intimate knowledge of the procedures as the operator, is required to dictate a record of the operation. In some hospitals a duplicate of the operation record as dictated by the first assistant is sent to the operator, who corrects it. Usually such a record reaches the operator several days after the operation has been done, and the details of the procedures are no longer fresh in his own mind.

My associates and I have begun a practice which has proved of value with service patients and should be found applicable to private patients as well. Unless there is some good reason to the contrary, every patient has a perfect right to know his full diagnosis and what was accomplished by operation. To most people an operation is a major event in their life and they should not be kept in complete ignorance. At the final discharge of patients they are given a typewritten sheet stating the date of operation, the operative procedures and the diagnosis in full. They keep the record for the benefit of the physician or surgeon who may see them in their next illness.

JOHN K. OWEN, M.D., Baltimore.

PRONUNCIATION OF MEDICAL TERMS

To the Editor:—I have read with interest the communications in THE JOURNAL from Dr. Spellman (January 18), Dr. Wallace (February 22), Dr. Royster (March 8), Dr. Lyon (March 22) and Dr. Reimann (May 17) on medical jargon and am wholeheartedly in accord with their views. Dr. Royster mentioned the all too common mispronunciation of the word "abdomen" and added that it is just as easy to be right as to be wrong.

The pronunciation of words so far as to attempt any correction of the mistakes of others does not interest me. I offer no criticism whatever to those who wish to use individual or colloquial pronunciation. However, I do ask the right to use correct diction without constant "corrections" by persons unacquainted with the guide for pronunciation which may be found in any standard dictionary.

I am most frequently "corrected" in my pronunciation of the word "digitalis." The only correct pronunciation of this word places the accent on the third syllable, the second letter of which is a long a. On one occasion I referred my critic to the latest edition of Webster's New International Dictionary. I was promptly informed that this work was "new fangled," whereupon we consulted the same work for the year 1892, and found the same single pronunciation.

Table 1 consists of twenty-two words which are commonly mispronounced. Half of these words are medical and half non-medical; all are commonly used (and misused) by physicians. Part A consists of eleven words of which there is but a single pronunciation. Part B consists of eleven words of which there is more than one acceptable pronunciation. However, in most

cases there is a preponderance in the preference for one pronunciation. Six of the words are examined in detail in table 2.

The twenty-two words presented here are but a few of those commonly mispronounced by medical men. However, I believe

TABLE 1—Twenty-Two Words Commonly Mispronounced

A Single pronunciation by all authorities

fibrillation fī bril 'r'shūn
digitalis dig 'tāl'is
duodenum du ō de'nūm
esophageal ē so fag'e al
exudative ēks u'da-tiv
syndrome sŷn'dro-mē
often of'n *
presentation prēz ēn-tā'shūn
per se pur sē
secretive se cre'tiv
route rōōt †

B More than one pronunciation

abdomen (table 2)
angina
(1) ān'jī na, (2) an jī'nā F & W, Win
(1) ān-jī'na, (2) an'jī-nā Web
respiratory
(1) re spir'a-to rī, (2) rēs'pī-ra to rī F & W, Win, Web
umbilicus
(1) ūm bī lī'kūs F & W
(1) ūm bī lī'kus, (2) um bil'ī kūs Win
(1) ūm bil'ī-kūs, (2) ūm bi-lī'kus Web
vitamin
(1) vī'ta-mīn or mīn F & W
(1) vī'ta mīn, (2) vit'a mīn (3) vī tam'in Win
(1) vī'ta mīn, (2) vit'a mīn (-mīne, -mīn, mēn) Web
data (table 2)
adult (table 2)
apparatus (table 2)
nomenclature (table 2)
research (table 2)
acclimate
(1) ā klī'mat F & W
(1) ā klī'māt Win
(1) ā-klī'mit, (2) āklī'mit Web

* The t is never pronounced in 'often'. It is mentioned in two dictionaries but not recommended. The only discussion with this word is between of n and of en.

† The only accepted pronunciation of "route" is rōōt. Two dictionaries refer to "rout" as colloquial but do not recommend its use. F & W, Funk and Wagnalls' New Standard Dictionary of the English Language, New York and London, 1939. Win, The Winston Simplified Dictionary, Philadelphia, 1936. Web, Webster's New International Dictionary of the English Language, Springfield, Mass., 1939.

TABLE 2—Pronunciations of Six Words

abdomen
āb dō'mēn² †
(1) āb dō'mēn, (2) ab'dō mēn¹ 3 5 6
āb'dō mēn⁴
data
dī'ta² 3 4 5 6 †
(1) dī'ta, (2) da'ta¹
adult
ā dūlt² 3 4 5 6 †
(1) ā dūlt, (2) ād'ūlt¹ 3
apparatus
ap'a ra'tūs² 3 4 5 6 †
(1) āp a rī'tūs, (2) āp a ra'tūs¹
nomenclature
nō mēn klī tur² 5 6 †
(1) nō'mēn klī'tur, (2) nō mēn'klī tūr¹ 2 3 4
research
rē surch'² 3 4 5 6 -
(1) rē surch' (2) re surch¹

1 Webster's New International Dictionary, ed 2
2 Oxford English Dictionary
3 English Pronouncing Dictionary, Jones
4 Universal Dictionary of English Language, Wyld
5 Century Dictionary
6 Funk and Wagnalls' New Standard Dictionary of the English Language
7 International French English and English French Dictionary, Hemphill
The material for table 2 was obtained from the preface of Webster's New International Dictionary.

them to be among those most commonly mistreated. This communication will have served its purpose if it leads the critic of diction to the dictionary before he voices his opinion.

A. HENRI CLAGETT JR, M.D., Milton Del

HYPERSENSITIVITY TO SULFATHIAZOLE

To the Editor—In their tabulation of the toxic manifestations of sulfanilamide, sulfapyridine and sulfathiazole (THE JOURNAL, September 6, p 850) Wein and Lieberthal state that symptoms of the gastrointestinal tract other than nausea and vomiting have not been reported following the administration of sulfathiazole. I should like to correct this statement by calling attention to a report published in the *Pennsylvania Medical Journal* in April 1941 (Hypersensitivity to Small Doses of Sulfathiazole). In 1 of the 4 cases reported the administration of moderate quantities of sulfathiazole was followed by active nausea, vomiting, fever and diarrhea. At a later date the same symptoms developed following the administration of a single tablet of the drug. Since the publication of this report I have encountered another case in which, as recently as two weeks previously, sulfathiazole had been given without causing a disturbance but in which nausea, vomiting and diarrhea developed in 2 instances following the administration of a single 0.5 Gm tablet, with the temperature rising in the second instance to 103.8 F.

MERRITT H. STILES, M.D., Philadelphia

HEPARIN

To the Editor—In a recent report of Ershler and Blaisdell (THE JOURNAL, September 13, p 927) a massive hematuria was reported after the use of heparin. Heparin was administered by continuous intravenous drip for nine days. The coagulation time occasionally rose to three and four hours, but an effort was made to maintain a coagulation time of approximately one hundred and twenty minutes.

Since heparin is now being widely used in various types of intravascular thromboses, such a report may deter some men from its deserved wide application. There is no evidence to show that a prolongation of the coagulation time over twenty minutes is ever necessary. Both the Canadian (Murray, G. D. W., and Best, C. H. The Use of Heparin in Thrombosis, *Ann Surg* 108:173 [Aug] 1938) and the Swedish (Crafoord, Clarence, and Jorpes, Erick. Heparin as a Prophylactic Against Thrombosis, THE JOURNAL, June 28, p 2831) investigators have advocated a prolongation of coagulation time to between ten and twenty minutes. Heparin has now been used and is being studied extensively at St. Luke's Hospital, but there has never been such a reaction produced, nor has a thrombus formed or a propagation of a preexisting thrombus been observed while the coagulation time has been kept between ten and twenty minutes.

GEZA DE TAKATS, M.D., Chicago

FORGOTTEN RESOURCES OF MEDICAL PRACTICE

To the Editor—Dr Willis C. Campbell and Dr Hugh Smith in THE JOURNAL, August 30, give us another example of a successful method in fresh compound fractures with a long hiatus of failure or worse between the two ends of successful treatment. Medical historians have a special item field in this subject. Our forefathers treated compound fractures successfully with camphor liniment. This method became as thoroughly forgotten as did some features of hydrotherapy, kept alive by practical nurses, highly valuable resources forgotten by regulars and specialists. Some one should present a paper on forgotten resources at some meeting of the profession. When savage operations became the custom in tuberculosis of the neck, I had a whole series going for weekly noting by the class and no operation excepting in late neglected cases with deep abscess already present.

ROBERT T. MORRIS, M.D.,
Merribrooke Farm
Stamford, Conn

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb 16 17, 1942 Council on Medical Education and Hospitals, Sec, Dr. William D. Cutter, 535 North Dearborn Street, Chicago.

MEDICAL CORPS, UNITED STATES NAVY

Examination. Assistant Surgeon with the permanent rank of Lieutenant (junior grade) and Acting Assistant Surgeon with the probationary rank of Lieutenant (junior grade), Jan. 5-9 Examination will be held at the Naval Hospitals at Chelsea, Mass., Newport, R. I., Brooklyn, Philadelphia, Norfolk, Va., Charleston, S. C., Pensacola, Fla., Corpus Christi, Tex., San Diego and Mare Island, Calif., Puget Sound, Wash., Great Lakes, Ill., Pearl Harbor, T. H., and Naval Medical Center, Washington, D. C. Apply Rear Admiral Ross T. McIntire, M. D., Surgeon General, U. S. Navy, Washington, D. C.

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, October 11, page 1287.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Part III Baltimore and New York City, October; Boston, November. Exec Sec, Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY *Written Part I* Various centers, March 31. Final date for filing application is Dec 31 Sec, Dr. Paul M. Wood, 745 Fifth Ave., New York City

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY *Oral Dec. 12 13* Final date for filing application is Nov 8 Sec, Dr. C. Guy Lane, 416 Marlboro St., Boston

AMERICAN BOARD OF INTERNAL MEDICINE *Oral April* in advance of the meeting of the American College of Physicians and June, in advance of the meeting of the American Medical Association Applications should be on file 6 weeks in advance of the date of oral examination. Sec, Dr. William S. Middleton, 1301 University Ave., Madison, Wis

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY *Written Part I Group B* Various centers, Jan. 3. *Oral Part II Groups A and B* Atlantic City, May or June Final date for filing application is March 1. Sec, Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh

AMERICAN BOARD OF OPHTHALMOLOGY *Written March 7* Final date for filing application is Dec 1 Sec, Dr. John Green, 6830 Waterman Ave., St. Louis

AMERICAN BOARD OF ORTHOPAEDIC SURGERY Washington, January. Final date for filing application is Nov. 1 Sec, Dr. Guy A. Caldwell, 3503 Prytania St., New Orleans, La

AMERICAN BOARD OF OTOLARYNGOLOGY *Oral and Written All Groups* Philadelphia, June, preceding the meeting of the American Medical Association. Final date for filing application is March 1. Sec, Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha, Neb

AMERICAN BOARD OF PEDIATRICS *Oral* Philadelphia, March or April, at the time of the Region I meeting of the American Academy of Pediatrics. Cleveland, May, at the time of the Region III meeting of the American Academy of Pediatrics. Los Angeles, May, at the time of the Region IV meeting of the American Academy of Pediatrics *Written* Locally, approximately 6 weeks in advance of the date of oral examination Sec, Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago

AMERICAN BOARD OF RADIOLOGY *Oral All Groups* Atlantic City, June 4 Final date for filing application is April 1 Sec, Dr. Byrl R. Kirklin, 102 110 Second Ave., S. W., Rochester, Minn

AMERICAN BOARD OF SURGERY *Written Part I* Various centers, Oct 6 *Oral Part II*, New York Nov 10 11 A meeting of the board will follow on the 12th Sec, Dr. J. Stewart Rodman, 225 S. Fifteenth St., Philadelphia

AMERICAN BOARD OF UROLOGY: *Written* Various centers, December. *Oral* Chicago, February Final date for filing application is Nov. 1. Sec, Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis

Kentucky Reciprocity Report

The State Board of Health of Kentucky reports 13 physicians licensed to practice medicine by reciprocity and 3 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners from May 28 through September 16. The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine	(1940)	Arkansas	
University of California Medical School..	(1925)	California	
University of Georgia Medical Department	(1915)	Georgia	
Loyola University School of Medicine..	(1937)	Illinois	
University of Illinois College of Medicine	(1919)	Illinois	
Indiana University School of Medicine..	(1940)	Indiana	
University of Louisville School of Medicine.	(1939)	Penna	
Johns Hopkins University School of Medicine	(1920)	New York	
Long Island College of Medicine..	(1940)	New York	
Ohio State University College of Medicine	(1929)	Ohio	
University of Cincinnati College of Medicine	(1941)	Ohio	
University of Pennsylvania School of Medicine..	(1930)	Penna	
University of Tennessee College of Medicine	(1940)	Tennessee	
School	LICENSED BY ENDORSEMENT	Year Grad	
University of Buffalo School of Medicine	(1939, 2)		
University of Oklahoma School of Medicine	(1937)		

Georgia June Report

The Georgia State Board of Medical Examiners reports the written examination for medical licensure held at Atlanta and Augusta, June 10-11, 1941. The examination covered 10 subjects and included 100 questions. An average of 80 per cent was required to pass. Ninety-three candidates were examined, 92 of whom passed and 1 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists...	(1941)	(1941)	83.9
Howard University College of Medicine.....	(1940)	(1940)	86.4
Emory University School of Medicine.....	(1939)	(1939)	85.1
(1941) 81.6, 83.2, 83.5, 85.2, 85.3, 85.5, 85.6, 85.7, 85.8, 85.8, 85.8, 85.9, 86, 86.2, 86.4, 86.5, 86.5, 86.7, 86.8, 86.8, 86.9, 86.9, 86.9, 87.1, 87.2, 87.4, 87.4, 87.7, 88, 88.2, 88.3, 88.4, 88.5, 88.8, 89.1, 89.2, 89.2, 89.8, 89.9, 89.9, 90.2, 90.3, 92			
University of Georgia School of Medicine	(1941)	(1941)	80.1,
80.3, 81, 81.1, 81.2, 81.5, 82, 82.7, 82.8, 82.9, 83.6, 83.6, 84.1, 84.4, 84.8, 85.1, 85.3, 85.3, 85.3, 85.3, 85.4, 85.7, 85.7, 85.8, 85.9, 86, 86, 86.6, 86.8, 86.8, 87.1, 87.2, 87.6, 87.8, 88.3, 88.4, 88.5, 91			
Johns Hopkins University School of Medicine...	(1941)	(1941)	85.5
University of Nebraska College of Medicine	(1933)	(1933)	85.6
Columbia University College of Physicians and Surgeons.....	(1941)	(1941)	93.4
Syracuse University College of Medicine.....	(1936)	(1936)	89.3
Jefferson Medical College of Philadelphia	(1941)	(1941)	89.2
University of Tennessee College of Medicine ..	(1938)	(1938)	87.2
University of Toronto Faculty of Medicine.....	(1937)	(1937)	84.9

School	FAILED	Year Grad.
Emory University School of Medicine.	(1941)	(1941)

Twenty-three candidates were licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners on June 12 and July 10. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Emory University School of Medicine.	(1927)	(1927)	N. Carolina
Loyola University School of Medicine	(1916)	(1916)	Wisconsin
University of Louisville School of Medicine	(1931)	(1931)	Tennessee,
(1940) Mississippi			
Tulane University of Louisiana School of Medicine...	(1940)	(1940)	Louisiana
Johns Hopkins University School of Medicine.	(1934)	(1934)	Maryland
Kansas City Medical College.....	(1904)	(1904)	Missouri
Leonard Medical School.....	(1913)	(1913)	W. Virginia
University of Oklahoma School of Medicine.	(1935)	(1935)	S. Carolina
University of Pittsburgh School of Medicine ..	(1936)	(1936)	Penna.
Medical College of the State of South Carolina.....	(1927),	(1927),	
(1933) South Carolina			
Meharry Medical College ..	(1931), (1938, 3), (1939)	(1939)	Tennessee
University of Texas School of Medicine.....	(1916)	(1916)	Texas
Medical College of Virginia	(1937)	(1937)	Virginia
University of Virginia	(1940)	(1940)	Virginia
Regia Universita degli			
Medicina e Chirurgia.....	(1935)	(1935)	Maryland

School	LICENSED BY ENDORSEMENT	Year Grad.
College of Medical Evangelists.	(1939)	(1939)

Florida June Report

The Florida Board of Medical Examiners reports the written examination for medical licensure held at Jacksonville, June 23-24, 1941. Ninety candidates were examined, 88 of whom passed and 2 failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
University of Arkansas School of Medicine .	(1925), (1941)	(1941)	2
Yale University School of Medicine.....	(1940)	(1940)	1
George Washington University School of Medicine.	(1937)	(1937)	1
Emory University School of Medicine.	(1941, 13)	(1941, 13)	13
University of Georgia School of Medicine.....	(1936), (1940)	(1940)	2
Loyola University School of Medicine.....	(1933), (1941)	(1941)	2
Rush Medical College.	(1933), (1940, 2)	(1940, 2)	3
University of Illinois College of Med.	(1928), (1935), (1940)	(1940)	3
State University of Iowa College of	(1933)	(1933)	1
University of Louisville School of ..	(1933)	(1933)	2
Tulane University of Louisiana Sch.	(1938), (1941, 7)	(1941, 7)	9
Johns Hopkins University School of Medicine.	(1916),	(1916),	3
(1940), (1941)			
University of Maryland School of Medicine and College			
of Physicians and Surgeons	(1933), (1940)	(1940)	2
Harvard Medical School	(1941)	(1941)	1
University of Michigan Medical School.....	(1927)	(1927)	1
Wayne University College of Medicine.....	(1939)	(1939)	1
University of Minnesota Medical School.....	(1936), (1939)	(1939)	2
Washington University School of Medicine.....	(1939), (1940)	(1940)	2
University of Nebraska College of Medicine.....	(1935)	(1935)	1
Columbia University College of Physicians and Sur			
geons	(1930), (1941)	(1941)	2
Long Island College of Medicine.....	(1928)	(1928)	1
New York Medical College, Flower and Fifth Avenue			
Hospitals	(1938)	(1938)	1
Syracuse University College of Medicine.	(1936)	(1936)	1

New York University College of Medicine....(1935), (1938)	2
University and Bellevue Hospital Medical College.....(1906), (1930)	2
University of Rochester School of Medicine and Dentistry.....(1938)	1
Duke University School of Medicine..(1938), (1940), (1941)	3
University of Cincinnati College of Medicine.....(1941)	1
Hahnemann Medical College and Hosp. of Philadelphia.(1939)	1
Temple University School of Medicine....(1939, 3), (1941, 2)	5
University of Pennsylvania School of Medicine.(1927), (1934)	2
University of Pittsburgh School of Medicine.....(1939)	1
Medical College of the State of South Carolina.....(1940)	1
Meharry Medical College.....(1941, 3)	3
University of Tennessee College of Medicine.....(1940, 2), (1941)	3
Vanderbilt University School of Medicine....(1916), (1941)	2
University of Texas School of Medicine.....(1921)	1
Medical College of Virginia.....(1930), (1939, 2)	3
School	Year Grad.
Ohio State University School of Medicine.....(1932)	
Meharry Medical College.....(1929)	

Louisiana June Report

The Louisiana State Board of Medical Examiners reports the written examination for medical licensure held at New Orleans, June 12-14, 1941. The examination covered 12 subjects and included 100 questions. An average of 60 per cent in each subject was required to pass. One hundred and forty-six candidates were examined, 145 of whom passed and 1 failed. Twelve physicians were licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists.....(1939)	85.5		
George Washington University School of Medicine.....(1935)	79.8		
Northwestern University Medical School.....(1941)	81.3		
Rush Medical College.....(1940)	85.2		
Louisiana State University School of Medicine.....(1941)*	79.5		
80.1, 80.2, 80.2, 80.2, 80.3, 80.4, 80.6, 80.8, 81.1, 81.4, 81.4, 81.4, 81.7, 81.9, 81.9, 81.9, 81.9, 82, 82, 82.1, 82.1, 82.1, 82.3, 82.4, 82.4, 82.4, 82.5, 82.5, 82.6, 82.7, 82.8, 82.8, 82.9, 83, 83, 83, 83.3, 83.4, 83.4, 83.5, 83.5, 83.8, 83.8, 84, 84, 84, 84.2, 84.2, 84.6, 84.8, 85.3, 85.3, 85.7, 86.1, 86.5, 86.5, 86.6, 88.3			
Tulane University of Louisiana School of Medicine....(1940)	82.3		
83.9, 85.3, (1941)* 77.1, 78.7, 78.7, 79.5, 80.2, 80.5, 80.7, 80.8, 80.8, 80.9, 81, 81.1, 81.1, 81.2, 81.3, 81.3, 81.4, 81.5, 81.6, 81.6, 81.7, 81.8, 81.9, 81.9, 81.9, 82.1, 82.1, 82.2, 82.3, 82.5, 82.6, 82.6, 82.8, 82.8, 82.9, 82.9, 82.9, 83, 83.2, 83.6, 83.6, 83.6, 83.7, 83.7, 83.8, 83.9, 83.9, 84.1, 84.1, 84.4, 84.4, 84.4, 84.5, 84.6, 84.8, 84.8, 84.8, 85, 85, 85, 85.1, 85.2, 85.7, 86.2, 86.8, 87.2			
University of Rochester School of Medicine and Dentistry.....(1939)	81.8		
University of Oregon Medical School.....(1940)	80.7		
Medical College of the State of South Carolina.....(1911)	76.8		
University of Texas Faculty of Medicine.....(1940)	81		
University of Wisconsin Medical School.....(1940)	83.7		
McGill University Faculty of Medicine.....(1938)	79.8		

School	Year Grad.
Tulane University of Louisiana School of Medicine.....(1941)	
School	Year Grad.
University of Arkansas School of Medicine.....(1939, 2)	Arkansas
University of Kansas School of Medicine.....(1920)	Kansas
Columbia University College of Physicians and Surgeons.....(1933), (1934)	New York
University of Tennessee College of Medicine.....(1931)	Mississippi
(1934), (1938, 2) Tennessee	Texas
Baylor University College of Medicine.....(1930), (1938)	Texas
University of Texas School of Medicine.....(1927)	Texas

* Licenses have not been issued.

South Dakota July Report

The South Dakota Board of Medical Examiners reports the written examination for medical licensure held at Pierre, July 15-16, 1941. The examination covered 13 subjects and included 100 questions. An average of 75 per cent was required to pass. Four candidates were examined, all of whom passed. Five physicians were licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Rush Medical College	(1940) 89.3.	(1941)	87.2
University of Cincinnati College of Medicine.....		(1941)	87.3
Hahnemann Med. College and Hospital of Philadelphia		(1938)	86.2
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School.....		(1939)	N. Dakota
University of Minnesota Medical School.....		(1937), (1940)	Minnesota
Creighton University School of Medicine.....		(1928), (1933)	Nebraska

West Virginia July Report

The Public Health Council of West Virginia reports the oral and written examination for medical licensure held at Wheeling, July 7-9, 1941. The examination covered 11 subjects and included 110 questions. An average of 80 per cent was required to pass. Nineteen candidates were examined, all of whom passed. Twenty-two physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists.....(1941)			87.8
Georgetown University School of Medicine.....(1940)			85.7
Rush Medical College.....(1940)			86.8
The School of Medicine of the Division of the Biological Sciences.....(1938)			85.6
Univ. of Louisville School of Medicine....(1938)	87.3	(1940)	84.6
Tulane University of Louisiana School of Medicine....(1940)			88.2
University of Maryland School of Medicine and College of Physicians and Surgeons.....(1940)	88.2	91.8	
University of Cincinnati College of Medicine.....(1941)			86.6
Temple University School of Medicine.....(1940)	86.9	88.1	
Univ. of Pennsylvania School of Medicine..(1939)	90.1	(1940)	90.2
Baylor University College of Medicine.....(1936)			89.7
Medical College of Virginia.....(1940)	85.5, 85.7, 86.1	90.6	

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School.....(1940)			Colorado
Rush Medical College.....(1937)			Michigan
The School of Medicine of the Division of the Biological Sciences.....(1938)			Michigan
University of Illinois College of Medicine.....(1937)			Illinois
Univ. of Maryland School of Medicine and College of Physicians and Surgeons (1931) Penna., (1939, 2), (1940, 2)			Maryland
Harvard Medical School.....(1937)			Maryland
University of Minnesota Medical School.....(1927)			Minnesota
Ohio State University College of Medicine.....(1939)			Ohio
University of Cincinnati College of Medicine.....(1939)			Ohio
Meharry Medical College.....(1940)			Tennessee
Medical College of Virginia....(1937, 2), (1939), (1940, 5)			Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.
Columbia University College of Physicians and Surgeons.....(1939)		
Duke University School of Medicine.....(1939)		

North Carolina June Report

The Board of Medical Examiners of North Carolina reports the written examination for medical licensure held at Raleigh, June 16-20, 1941. The examination covered 7 subjects and included 70 questions. Fifty-four candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine.....(1941)	85.6, 86.4	93.1	
Emory University School of Medicine.....(1941)	90.4	90.8	
Rush Medical College.....(1941)	84.5	91.1	
Tulane University of Louisiana School of Medicine.....(1941)			91.1
University of Maryland School of Medicine and College of Physicians and Surgeons.....(1939)	90.7, (1941)	89.3, 91.5	91.6
Harvard Medical School.....(1937)	89.5	(1941)	91.5
Cornell University Medical College.....(1941)			93.4
Long Island College of Medicine.....(1941)			87.8
Duke University School of Medicine.....(1939)	92, (1941)		86.4
Hahnemann Medical College and Hospital of Philadelphia.....(1941)			85.8
Jefferson Medical College of Philadelphia.....(1941)			86.8
87.4, 89.1, 89.2, 89.7, 90, 90.1, 91, 91.8, 91.9			
Temple University School of Medicine.....(1940)	82.8	87.3	
(1941)	86.3, 88.3, 88.9, 89.7		
University of Pennsylvania School of Medicine.....(1940)			91.6
(1941)	88, 89.1, 92.2, 92.6, 96.2		
Medical College of the State of South Carolina.....(1941)			84.5
87.8, 90.3			
University of Tennessee College of Medicine.....(1938)			85.1
Vanderbilt University School of Medicine.....(1941)			90.3
Medical College of Virginia.....(1941)	82.5, 86.5, 89.2	90, 92	
University of Virginia Department of Medicine.....(1941)			91.4
University of Wisconsin Medical School.....(1937)			90.4
McGill University Faculty of Medicine.....(1941)			90.3

One physician was licensed to practice medicine by reciprocity and 4 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners on July 16. The following schools were represented:

The following schools were represented:			
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with Virginia
University of Virginia	Department of Medicine.....	(1940)	
School	LICENSED BY ENDORSEMENT	Year Grad.	
Duke University	School of Medicine.....	(1938),	(1939, ?)

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals Not for Profit: State Unemployment Compensation Act Not Applicable to Charitable Hospital.—Anna Larson and Emory Gustafson claimed certain benefits under the Washington unemployment compensation act based on their former employment in a hospital owned and operated by the Virginia Mason Hospital Association, and the matter eventually reached the Supreme Court of Washington. Since the Washington unemployment compensation act exempts from its provisions a corporation "organized and operated exclusively for religious, charitable, scientific, literary, or educational purposes, . . . no part of the net earnings of which inures to the benefit of any private shareholder or individual," if the hospital association was so organized and operated it was exempt from the act and its employees were not entitled to any benefits under the act.

To determine this question it was necessary for the court to consider the history of the premises occupied by the hospital association and the interrelationships of the hospital and certain other organizations. In 1919 a corporation organized for profit was incorporated to operate the hospital premises and facilities, and it did so until 1934. In that year the hospital association was incorporated as a corporation not for profit without capital stock. Its original incorporators constituted its members, and vacancies in membership were to be filled by successors designated by the acting members. The association is managed by a board of trustees, each of whom must be a member of the corporation. The incorporators of the hospital association, who became its members, trustees and officers, were persons who had held the controlling stock interest in the corporation for profit which owned the hospital premises. The hospital association shortly after its incorporation in 1934 purchased, for an admittedly fair price, all the assets and assumed all the liabilities of the corporation for profit, paying for these assets by bonds bearing 8 per cent interest and secured by a second mortgage on the assets, which were distributed to the shareholders of the selling corporation. The Mason Clinic, a copartnership for profit of practicing physicians, occupies the ground floor of the hospital building on a rental basis. Of the thirteen members of the clinic, seven are trustees of the hospital association. The clinic owns certain equipment and appliances located on the clinic floor and the hospital association at a fair charge utilizes the equipment and facilities of the clinic when necessary. Nurses and interns of the hospital render certain services to the clinic. Books of the clinic and the hospital association are kept separate and distinct.

It was contended that (1) the holders of the bonds issued by the hospital association by reason of the receipt of interest and principal secure to their private gain a part of the association's net earnings and (2) net earnings of the association inure to private individuals by reason of the interrelation of the personnel and activities of the trustees and association on one hand and the bondholders and the clinic on the other. In support of the first contention it was argued that the interest of the shareholders of the original corporation for profit was practically worthless in 1934 when the sale was made to the hospital association and that, by this transfer and reorganization, for their almost hopeless insecurity there was substituted a favorable financial position in which, as secured creditors, they obtained greater assurance of the eventual return of their capital investment, plus periodic payments of interest. If in fact, said the court, the equity of the original corporation for profit was artificially inflated for the purpose of the sale of the assets to the association, and bonds were issued on the basis of this false value, or if the interest was at an excessive rate, then this contention would be sustainable. In substance, these would amount to devices whereby the net earnings of the hospital association would inure to the benefit of private individuals, the bondholders. But, continued the court, no findings were made in the lower forums concerning the value of the equity of the previous corporation for profit; there was testimony that the value of the assets exceeded the amount contracted therefor by the hospital association; and there was no circumstantial evidence which

would support a conclusion that the sale price of the assets was padded. It is true that, with the exception of two years, during the fifteen years of the operation of the corporation for profit no profits were forthcoming from operations. Had findings been made in any of the lower forums that the shareholders' interest in the corporation for profit had little or no value at the time of the sale in 1934, such a finding might have had to stand on this appeal, on the theory that the value should be determined by earnings rather than from a consideration of cost minus a proper depreciation.

Even though the assets were correctly valued in their sale to the hospital association, said the court, if the interest rate of the bonds issued was exorbitant, the excessive interest would effect, in reality, a distribution of the net earnings to the bondholders. The court, however, did not believe that an 8 per cent interest rate was excessive when the junior status of the bondholder's security is considered in the light of the fact that the assets in the main were usable only for hospital purposes, thus, obviously, affecting their value in the case of a forced sale.

The record, in the opinion of the court, did not justify a finding that the interrelation of the personnel and activities of the trustees and the association on one hand and the bondholders and the clinic on the other hand effected a distribution of a part of the net income of the hospital association to private individuals. The hospital association and the clinic, said the court, have meticulously kept their affairs separate. All use made of equipment and space belonging to one is promptly paid for by the other at a fair and reasonable rate. An arrangement by which essential services are supplied to the hospital at a reasonable cost, and under which a reasonable rental value is paid to the hospital for the use of its services, is not an allocation of the net earnings of the hospital to the benefit of private individuals. Student nurses taking their training in the hospital each serve two months in the clinic, and nothing is paid to the association for these services, the association providing all expenses incident to the nurses' training, but it appears without dispute that these services are of no benefit to the clinic because the nurses, not having had any previous laboratory or roentgen ray experience, are taught procedures in those fields by the clinic and their services cease when they reach the point at which they would be of some value to the clinic. Nor, said the court, does the record justify a finding that the clinic utilizes the services of hospital interns without charge. Actually the clinic pays all of an intern's salary for the period that he serves partially in the clinic. The evidence compels the conclusion that the clinic has consistently fully reimbursed the hospital association for any benefit gained from services performed by interns or nurses employed by the association. So far as there is an integration of the services provided by each, this occurs only to the extent that each renders services complementary to the other. While the hospital uses laboratory and roentgen-ray facilities owned by the clinic, there is no evidence that the clinic has taken any advantage whatever of the hospital in supplying essential complementary facilities. This arrangement cannot be said to facilitate the clinic's reaching the association's net earnings. Nor could the court understand how the joint employment of a manager by the hospital and the clinic would alter the result, as that arrangement appeared to be only sound business economy. Nor did the court think it at all material that the trustees of the association were the persons who had previously run the corporation for profit and were in turn members of the clinic. When a clinic, said the court, is operated for private profit in conjunction with a purportedly charitable hospital in such a manner that the hospital receives full consideration from the clinic for the goods and services with which the hospital supplies the clinic, and when the hospital pays the clinic only reasonable and usual prices for the services supplied by the latter, the hospital cannot be treated as an institution operated for the private profit of the clinic. *Board of Supervisors v. Picketsburg Hospital*, 173 Miss. 805, 163 So. 382; *Rush Hospital Association v. Board of Supervisors*, 187 Miss. 204, 192 So. 829. In all probability the clinic does gain certain incidental benefits from its arrangements with the hospital association, but it does not appear how any incidental benefits which may be gained by the clinic can in any way adversely affect the net earnings of the hospital association.

For the reasons stated, the court concluded that no portion of the net earnings of the hospital association inured to the benefit of any private shareholder or individual and that consequently the hospital association was entitled to exemption from the state unemployment compensation act. Accordingly the claimants were denied unemployment compensation benefits.—*Virginia Mason Hospital Ass'n v. Larson*, 114 P. (2d) 976 (Wash., 1941).

Malpractice: Sloughing Following Use of Sodium Morrhuate in Treatment by Ligation for Varicose Veins.—The plaintiff suffered from varicose veins. Obtaining no relief from treatment by local injection directly into the affected area of the legs, she went to the defendant physician who then undertook to treat by the "ligation method." An incision was made in the patient's left groin and the saphenous vein lying shortly below the surface was exposed and isolated from the surrounding tissues. After the flow of blood had been interrupted by the use of clamps, that vein was severed and the portion of the vein above the severance was "tied and disregarded." The portion running down into the leg was then injected with 2.5 to 3 cc. of sodium morrhuate, an irritating substance, "designed to put that vein and its tributaries out of order," which was accomplished by placing a blunt needle (cannula) into the severed end of the vein, tying it fast and discharging the solution, which then ran down into the affected areas of the leg. At first only a local anesthetic was administered to the patient. However, because of severe pains which had their onset when the solution was discharged into her left leg, "gas" was given her. Then the process was repeated on the right leg. After the operation the pain continued in the left leg and sloughing appeared on that leg—just when was a subject of some dispute, but it was quite generally present on the lower part of the thigh and knee region. Eventually, for all normal purposes, her left leg became paralyzed and useless. Her right leg, however, recovered perfectly. She instituted suit against the defendant physician and another for malpractice. After a verdict in her favor, the trial court ordered a new trial, which action was affirmed by the Supreme Court of Minnesota on appeal (*Simon v. Larson*, 207 Minn. 605, 292 N. W. 270). At the conclusion of the plaintiff's evidence in the second trial, the trial court directed a verdict for the defendant and denied a motion made by the plaintiff for a new trial. The plaintiff then appealed to the Supreme Court of Minnesota.

The only question for the determination of the Supreme Court was whether or not there was enough evidence of actionable negligence on the part of the defendant to have warranted the submission of the cause to the jury. The patient did not claim that the defendant physician lacked requisite skill or that there was a departure from recognized practice in the treatment he gave her. She claimed that the defendant in using a recognized technic failed to use ordinary care with the result that the solution, which should have been confined to the interior of the vein, was carelessly spilled in the vicinity of the incision, causing sloughing. While there was no medical testimony adduced on behalf of the plaintiff at the second trial, she argued that under her theory of liability there was no necessity for medical testimony on her behalf. There may be some force, said the Supreme Court, to the contention that medical authority is not always necessary in these cases. But where certain facts of medical science have been established by uncontradicted testimony of experts, the Supreme Court cannot ignore these facts in passing on the action of the trial judge. The mere fact of the occurrence of an injury does not prove negligence. According to the patient's theory, in the injection of the cannula into the open end of the vein, the defendant carelessly caused a hole to be made in the vein or its tributaries, permitting the fluid to escape into the tissues. It would seem that before this view would be entitled to credence, proof would be essential that contact of sodium morrhuate with tissue is dangerous or likely to produce sloughing. Yet there was testimony adduced on behalf of the physician that in the treatment of hernia this solution is injected directly into the tissues without producing sloughing. In fact, the reason that in this sort of a procedure sodium morrhuate superseded salt as an irritant is its tendency not to cause sloughing. Although minor sloughs have been known to follow the ligation method, these are difficult to avoid

despite all reasonable precautions. Some spillage ("a few drops") is not uncommon or regarded as dangerous.

During the cross examination of the defendant physician, continued the court, some medical evidence was produced which was favorable to the plaintiff's theory. Thus apparently it was admitted that sloughs were possible if sufficient amounts of sodium morrhuate were used but that the amount necessary to produce that result differed with individuals. Also, neither the defendant nor another expert witness knew of any medical authority which said that sodium morrhuate would not produce sloughs. But with respect to the patient, it appeared that a standard amount of 2.5 to 3 cc. of sodium morrhuate was used on each leg, producing different results on the two legs. The defendant, however, testified that he had never used in excess of 5 cc. but had heard of 25 cc. being used without producing sloughs. The plaintiff in this case, said the court, in no respect, circumstantially or otherwise, established what quantity of sodium morrhuate was likely to produce sloughing nor that such quantity had been used in this case. Without that proof, reasoning from the fact of sloughing to the fact of improper spillage would be wholly conjectural.

As indicative of neglect on the part of the defendant, the plaintiff relied on the fact that she experienced pain when the fluid was discharged into her vein. But, answered the court, the presence of pain in this type of an operation was said not to be a distinguishing feature. The process requires the injection of an irritating solution into a vessel containing sensory nerves, and "a great many people do have a certain amount of pain, at least 20 per cent of them do." The plaintiff also urged as corroborative of her claim that the sodium morrhuate had been negligently injected the fact, so she claimed, that the sloughing first occurred at the site of the incision. Even should the preponderance of the evidence be accepted in this respect, said the court, this proposition would fail. The medical testimony was that the sloughing began at least 6 inches (15 cm.) below the incision and was quite generally present down to the knee in the same degree of involvement. But even taking the plaintiff's version of the place of origin, this meets uncontradicted medical testimony that where sloughing occurs at the site of the incision the inflammation and involvement are localized. Here the involvement was too general and extensive to be reconciled with the plaintiff's theory.

Under the state of the evidence referred to, said the court, where all the plaintiff had to rely on was the fact of injury, plus claims as to place of origin and an unestablished assertion that the sodium morrhuate was the cause of the sloughing as opposed to the view of all experts in the case that the cause of this unfortunate accident was unknown, we acquiesce in the view that the facts presented did not present a jury issue on the questions of negligence and causation.

For the reasons stated, the judgment of the lower court in favor of the physician was affirmed.—*Simon v. Larson et al.*, 298 N. W. 33 (Minn., 1941).

Society Proceedings

COMING MEETINGS

- American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 19-23. Dr. William P. Wherry, 107 South 17th St., Omaha, Executive Secretary.
- American College of Surgeons, Boston, Nov. 3-7. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.
- American Society of Tropical Medicine, St. Louis, Nov. 11-14. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
- Associated Anesthetists of the United States and Canada, Boston, Nov. 3-7. Dr. C. J. Wells, 1932 S. Salina St., Syracuse, N. Y., Secretary.
- Association of American Medical Colleges, Richmond, Va., Oct. 27-29. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.
- Association of Military Surgeons of the United States, Louisville, Ky., Oct. 29-Nov. 1. Colonel James M. Phalen, Army Medical Museum, Washington, D. C., Secretary.
- Central Society for Clinical Research, Chicago, Nov. 7-8. Dr. Carl V. Moore, Washington University School of Medicine, St. Louis, Secretary.
- Omaha Mid-West Clinical Society, Omaha, Oct. 27-31. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha, Secretary.
- Puerto Rico, Medical Association of, San Juan, Dec. 11-14. Dr. David E. Garcia, P. O. Box 3866, San Juan, P. R., Secretary.
- Radiological Society of North America, New York, Dec. 1-5. Dr. Donald S. Childs, 607 Medical Bldg., New York, Secretary.
- Society for the Study of Asthma and Allied Conditions, New York, Dec. 6. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Southern Medical Association, St. Louis, Nov. 10-13. Mr. C. P. Lorant, Empire Bldg., Birmingham, Ala., Secretary.
- Western Surgical Association, St. Paul, Dec. 5-6. Dr. Arthur R. Metz, 2449 Washington Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery 11:41-80 (Aug.) 1941

- Problem of Brucellosis. L. L. Terry, Galveston, Texas.—p. 41.
- Functional Cardiac Disorders. F. Wilkerson, Montgomery.—p. 45.
- Treatment of Common Skin Diseases. H. R. Cogburn, Mobile.—p. 51.
- Medical Problems Initiated by Mobilization of Man Power. B. Word and G. E. Leone, Camp Shelby, Miss.—p. 54.
- Reparative Power of Bone: Encouragement to Conservatism in Treatment of Complicated Fractures of Extremities: Report of Case. R. S. Hill, Montgomery.—p. 57.
- Malaria in Endemic Area: Its Control by Treatment. G. H. Fondé and E. C. Fondé, Mobile.—p. 65.
- Internal Fixation of Fractures of Neck of Femur. D. Doherty, Selma.—p. 70.

American Journal of Diseases of Children, Chicago 62:231-480 (Aug.) 1941

- *Infectious Lymphocytosis. C. H. Smith, New York.—p. 231.
- Studies of Blood of High School Girls. Jane M. Leichsenring, Eva G. Donelson and Lucille M. Wall, St. Paul.—p. 262.
- Serum Phosphatase as Aid in Diagnosis of Cretinism and Juvenile Hypothyroidism. N. B. Talbot, Brookline, Mass.; G. Hoeffel, H. Shwachman and E. L. Tuohy, Boston.—p. 273.
- Relation of Calcium, Phosphorus and Nitrogen Retention to Growth and Osseous Development: Long Time Study of Three Preschool Boys. Amy L. Daniels, with technical assistance of Gladys J. Everson, Mary F. Deardorff, Olive E. Wright and Florence I. Scoular, Iowa City.—p. 279.
- Lumbar Puncture as Factor in Pathogenesis of Meningitis. L. G. Pray, Washington, D. C.—p. 295.
- *Immunity to Tetanus Induced by Combined Alum-Precipitated Diphtheria and Tetanus Toxoids: Based on Study of Sixty-Five Allergic Children Given a Third or "Repeat" Dose. M. M. Peshkin, New York.—p. 309.
- Deprivation of Placental Blood as Cause of Iron Deficiency in Infants. E. E. Wilson, Oak Park, Ill.; W. F. Windle and H. L. Alt, Chicago.—p. 320.
- Fat Excretion of Premature Infants: I. Effect on Fecal Fat of Decreasing Fat Intake. H. H. Gordon and Helen McNamara, New York.—p. 328.
- Delayed Development of Antibody to Staphylococcus Toxin in Diabetic Children. G. Bates and C. Weiss, San Francisco.—p. 346.

Infectious Lymphocytosis.—Smith cites 11 cases of two conditions characterized by lymphocytosis which are often confused with infectious mononucleosis and sometimes with leukemia. The clinical and hematologic features of the two syndromes differentiate them from the two other diseases. Two cases characterized by transitory hyperleukocytosis and a striking increase in lymphocytes illustrate one of the syndromes, and the remaining 9, characterized by a less intense and more prolonged lymphocytosis, the other syndrome. In the 2 children, 3½ and 6 years of age, there was unexpected and exaggerated lymphocytosis with maximal leukocyte counts of 98,000 and 44,300 cells per cubic millimeter respectively. The course in each was benign. There was no lymphadenopathy, enlargement of the spleen or clinical or physical signs characteristic of infectious mononucleosis or leukemia. Both children had been hospitalized twice before when there had been a moderate leukocytosis with a neutrophilic response. After the hyperleukocytosis subsided the children eventually showed a moderate leukocyte elevation with an absolute increase in lymphocytes. Nasopharyngitis was associated with this blood response and the other complaints. The common complaint of the children from 7 months to 11 years of age of the second group was persistent low grade fever dating back to a well defined acute infection of the upper part of the respiratory tract. The symptoms were most conspicuous in children less than 6 years of age. There was an absolute increase in the lymphocytes, as compared with

a relative increase in the older children. However, in 1 patient, a child of 7½ years, the febrile reaction persisted for four years. In several the preponderance of lymphocytes, which sometimes stained abnormally instead of giving an expected neutrophilic response, led the attending physicians to suspect blood dyscrasia. In both groups the outlook was favorable. The first type or the unexpected hyperleukocytosis appears for a short period and is not accompanied by any recognizable symptoms or physical signs. The associated symptoms of the second type include anorexia, pallor, fatigability and paraumbilical pain. The two types are classified as acute and chronic infectious lymphocytosis respectively. Many instances of lymphocytosis in children whose titer of heterophilic antibody is normal are cases of infectious lymphocytosis rather than infectious mononucleosis. The etiologic agent of each type is probably not represented by the bacterial flora obtained from the nasopharynx but probably is an as yet undetermined virus related to infection of the upper part of the respiratory tract.

Immunity to Tetanus.—Peshkin determined the effect on the tetanus antitoxin response and the duration of immunity of a third or "repeat" injection of 0.5 cc. of combined alum-precipitated toxoids given to 65 children from three to fifteen months after the completion of primary immunization with two 0.5 cc. doses of diphtheria and tetanus toxoids. Local reactions both after the third and after the first two injections occurred in about 25 per cent of the children, and 3 per cent of them had an elevated temperature for about one day compared to 1 per cent following the first two doses. Urticaria or asthma was not encountered. From three months to two years after the repeat injection, negative reactions to scratch tests with the undiluted toxoids were obtained from 36 children. Adequate tetanus antitoxin titers (0.01 unit or more of antitoxin per cubic centimeter of blood serum) were attained by all children within one month. In the majority the titer was at its maximal level on the seventh day after the repeat dose. The antitoxin values obtained by most of the children within one month of the third dose varied according to the antitoxin level present immediately preceding the repeat dose. After the third dose the antitoxin titer increased to not less than 0.296 unit per cubic centimeter of serum. The percentages of children with adequate immunity one and one and a half years after the third dose of toxoids were 92 and 77 as compared to 65 and 50 for a comparable group of children after a second dose.

American J. Obstetrics and Gynecology, St. Louis 42:193-372 (Aug.) 1941. Partial Index

- Diagnostic Value of Vaginal Smears in Carcinoma of Uterus. G. N. Papanicolaou and H. F. Traut, New York.—p. 193.
- Study of Ovaries and Endometrium of Patients with Fundal Carcinomas. H. O. Jones and J. I. Brewer, Chicago.—p. 207.
- Question of Glomerular Damage Following Toxemia of Pregnancy. L. C. Chesley, Jersey City, N. J.—p. 229.
- Effects of Certain Gonadotropic Extracts on Anovulatory Cycles and Amenorrhea. C. L. Buxton, New York.—p. 236.
- Are Estrogens Carcinogenic in Human Female? II. Atypical Endometrial Proliferation in Patient Treated with Estrogens. S. H. Geist, R. I. Walter and U. J. Salmon, New York.—p. 242.
- Cervical Dysplasia: Study of Eighty-Six Cases. N. B. Sackett, New York.—p. 248.
- Clotting Mechanism of Menstrual Fluid. Helen Iglauer Glueck and I. A. Mirsky, Cincinnati.—p. 267.
- Friedman Test on Spinal Fluid in Cases of Hydatidiform Mole and Pregnancy. M. Vesell and S. Goldman, New York.—p. 272.
- *Inoculations of Intestinal and Vaginal Trichomonads into Human Vagina. L. G. Feo, A. E. Rakoff and R. M. Stabler, Philadelphia.—p. 276.
- Tattooing with Mercuric Sulfide for Treatment of Intractable Pruritus Vulvae and Ani: Anatomicoclinical Study. R. Turell, New York.—p. 290.
- Syphilis and Uncontrolled Fertility. Regine K. Stix, New York.—p. 296.
- Successful Use of Progesterone in Case of Repeated Spontaneous Abortion. A. C. Posner and P. H. Sechzer, New York.—p. 324.
- Morbidity Following Vaginal Examinations During Labor. H. W. Erving and E. F. Meister, Buffalo.—p. 326.
- Ovarian Pregnancy with Living Child and Mother. R. B. Nicholls, Norfolk, Va.—p. 341.

Inoculations of Trichomonads into Vagina.—In order to determine whether *Trichomonas vaginalis* and the intestinal trichomonad *Trichomonas hominis* were one and the same organism, Feo and his co-workers inoculated the organisms into the vaginas of 50 human volunteers. Their data are based on

the results obtained from three experiments: the implantation of *T. hominis* into trichomonas-free vaginas, *T. hominis* into vaginas harboring *T. vaginalis* and *T. vaginalis* into trichomonas-free vaginas. Twenty-one of 25 women whose vaginas were free of *T. vaginalis* remained negative after repeated intra-vaginal inoculations of *T. hominis* cultures. Likewise 22 of 25 women positive for *T. vaginalis* remained negative for *T. hominis* after similar inoculations. However, *T. vaginalis* was easily transferred to 8 of 10 women whose vaginal secretions were previously negative for the organisms. Therefore the authors conclude that contamination from the rectum is not the origin of vaginal trichomoniasis. The experiments also support the opinion that *T. vaginalis* and *T. hominis* are separate and distinct species.

American Journal of Ophthalmology, Cincinnati

24:731-850 (July) 1941

- Retinal Tuberos Sclerosis (Bourneville's Disease). A. Loewenstein and Janet Steel, Glasgow, Scotland.—p. 731.
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Conjunctival Dialysis in Treatment of Glaucoma Recurrent After Sclerectomy. H. Ferrer, Habana, Cuba.—p. 788.
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Curved Knives for Sclerectomy Operations for Glaucoma. C. Berens, New York.—p. 804.

24:851-978 (Aug.) 1941

- Mechanical Factors in Etiology of Acute Glaucoma. H. S. Sugar, Chicago.—p. 851.
Marble Bones and Optic Atrophy. R. O. Riser, Park Ridge, Ill.—p. 874.
Gonorrheal Ophthalmia and Gonorrheal Ophthalmia Neonatorum: Evaluation of Treatment. E. V. Muir, Salt Lake City.—p. 879.
Transitory Myopia: Complication of Sulfanilamide Therapy. S. S. Blankstein, Milwaukee.—p. 895.
Keratoconjunctival Lesions Observed at High Altitudes in Bolivia. A. Solares, Sucre, Bolivia, South America.—p. 900.
Capsulotomy and Iridocapsulotomy: Technic, with Special Keratome and Iridocapsulotomy Scissors. C. Berens, New York.—p. 915.
Mechanism and Causes of Hyphema After Cataract Extraction. D. Vail, Cincinnati.—p. 920.
Ocular Hypertelorism of Greig. E. A. Vorisek, Chicago.—p. 928.

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- Studies on Aqueous Humor. H. Davson and C. B. Weld, Halifax, N. S.—p. 1.
Corticalactin, Lactation Factor of Adrenal. H. J. Spoor, F. A. Hartman and Katharine A. Brownell, Columbus, Ohio.—p. 12.
Gastrointestinal Tract Motility in Absence of Bile. R. F. Ackerman, H. Curl and L. A. Crandall Jr., Memphis, Tenn.—p. 32.
Relation Between Phosphate Changes in Blood and Muscle, Following Dextrose, Insulin and Epinephrine Administration. S. Soskin, R. Levine and O. Hechter, Chicago.—p. 40.
Quantitative Effects of Immediate Antithrombins. A. J. Glazko and J. H. Ferguson, Ann Arbor, Mich.—p. 54.
Relative Responses of Dorsal Metacarpal, Digital and Terminal Skin Arteries of Hand in Vasoconstrictor Reflexes. A. B. Hertzman, St. Louis.—p. 59.
Effect of Dosage and Duration of Administration on Antiuremic Effect of Desoxycorticosterone. Christiane Dosne, Montreal, Canada.—p. 71.
Extent to Which Radioactive Chloride Penetrates Tissues and Its Significance. Jeanne F. Manery and Lorraine F. Haege, Rochester, N. Y.—p. 83.
Effects of Some Drugs on Crossed Phrenic Phenomenon. A. M. Seligman and W. A. Davis, Boston.—p. 102.
Demonstration of Vitamin A in Retina by Fluorescence Microscopy. R. Greenberg and H. Popper, Chicago.—p. 114.
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Phenylthiocarbamide Taste Thresholds of Rats and Human Beings. C. P. Richter and Kathryn H. Clisby, Baltimore.—p. 157.

American Journal of Surgery, New York

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- Le Fort Colpocleisis: Analysis of Thirty-One Cases with Description of Technic Used by Authors. C. G. Collins and F. R. Lock, New Orleans.—p. 202.
Extra-Articular Arthrodesis of Knee Joint. D. King and V. Richards, San Francisco.—p. 208.
*Hypoprothrombinemia in Intestinal Disorders. W. E. Abbott and W. D. Holden, Cleveland.—p. 215.
*Treatment of Staphylococcal Infections with Thiazole Derivatives of Sulfanilamide. C. A. Beling, Newark, N. J.—p. 219.
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Method for Preventing or Diminishing Peritonitis from Leakage After Intestinal Resection or Perforation. H. Koster, Brooklyn.—p. 248.
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Use of Prostigmine in Abdominal and Vaginal Operations for Relief of Postoperative Distention and Urinary Retention in Series of Ninety-Six Consecutive Cases. I. Tractenberg and W. Oliver, Brooklyn.—p. 284.
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Cerebral Complications Following Surgical Operation: Prevention and Treatment. A. Behrend and Helena A. Riggs, Philadelphia.—p. 296.
Tubed Pedicle Graft in Facial Reconstruction: Its Superiority When Subcutaneous Loss Is Present. C. L. Wilmoth, Pittsburgh.—p. 300.
Rabies. S. W. Moore, New York.—p. 306.
Muscle Behavior Following Infantile Paralysis. H. E. Hipps, Marlin, Texas.—p. 314.
Osteoplastic Craniotomy. H. C. Trumble, Melbourne, Australia.—p. 319.
Hypoprothrombinemia in Intestinal Disorders.—Abbott and Holden encountered 7 cases of hypoprothrombinemia due to various intestinal disorders, 2 to inadequate diets, 3 to intestinal fistulas with intubation, 1 to prolonged vomiting and 1 to intestinal intubation for obstruction. The patients were treated with menadione and iron salts of taurocholic and glycocholic acids when indicated. The authors observed a more definite hypoprothrombinemia in patients in whom intestinal intubation was being employed than in those who have had only inadequate diets. Hypoprothrombinemia may occur in patients with a high ileostomy from a loss of food products and/or bile. Inhalation anesthesia may produce temporary hepatic damage and even marked hepatic necrosis. Changes in the prothrombin level found under such conditions are in all probability related to the duration of the anesthetic and the amount of hepatic dysfunction produced by it or to the effects of the anesthetic superimposed on an already diseased liver. However, the authors believe that a fall of the prothrombin blood level of more than 5 to 10 per cent must be attributed to something other than the usual gas-oxygen-ether anesthesia. They believe that in their patients the postoperative decrease in prothrombin levels resulted only in small part from anesthesia but was produced largely because of the lack of vitamin K and/or loss of bile. Prothrombin blood levels of 100 per cent of normal were obtained in forty-eight hours or less in 3 patients with obstructive jaundice having respectively prothrombin levels of 5, 10 and 31 per cent of normal and given 8 mg. of menadione and bile salts.
Thiazole Derivatives for Staphylococcal Infections.—Beling reports on sulfathiazole and sulfamethylthiazole in the treatment of 130 patients with staphylococcal infection. The drugs were given orally, intravenously, rectally and locally. Of the 130 patients, 116 were improved, 5 were not improved and 9 died. Four patients died of other infections after the staphylococcal infection was eradicated. The remaining deaths were due strictly to staphylococcal disease or septicemia. Pyodermas, carbuncles, infected wounds, cellulitis and abscesses were treated until the lesion had resolved or disappeared. In febrile conditions treatment was continued until the temperature, pulse and respirations had been normal for at least one week; later this was reduced to four days. Patients with acute osteomyelitis and other forms of staphylococcal septicemia may have to receive the drug for many weeks. Collec-

tions of pus must be evacuated; chemotherapy does not alter the indications for surgical drainage. The time required for a staphylococcal lesion to respond depends on the type and stage of its development. The statement that if sulfathiazole is not of benefit in three days it will not be of any use is, the author believes, misleading, ill advised and inaccurate. Furuncles and carbuncles will show definite changes within three days, often progressing to complete resolution. Certain cases of cellulitis, on the other hand, require up to eight days and longer. A miraculous cure of staphylococcal pneumonia, acute osteomyelitis and staphylococcal septicemia should not be expected within two or three days. The data indicate that sulfamethylthiazole is at least as active as sulfathiazole. Sulfamethylthiazole has not been officially accepted because of some serious neuritic reactions. A significant mortality decrease from severe staphylococcal infections indicates the value of the thiazoles as compared with sulfanilamide and sulfapyridine. Various toxic manifestations are encountered. Sulfamethylthiazole caused 1 instance of lower motor neuron involvement, 2 of anemia, 5 of cyanosis and 2 of diplopia. Although sulfamethylthiazole is strongly active against staphylococci it is a potentially dangerous drug. Sulfathiazole is the only efficient, accepted drug for the treatment of these infections.

Annals of Surgery, Philadelphia

114:161-320 (Aug.) 1941

- *Cooperation Between Army Services of Evacuation and Hospitalization. H. H. M. Lyle, New York.—p. 161.
Diagnosis and Treatment of Cardiac Trauma. D. C. Elkin, Atlanta, Ga.—p. 169.
Effective Method for Development of Collateral Circulation to Myocardium. P. Heinbecker and W. A. Barton, St. Louis.—p. 186.
Treatment of Vascular Injuries. J. M. Mason, Birmingham, Ala.—p. 191.
Radical Operative Treatment for Suppurative Phlebitis and Its Results. H. Neuhof, New York.—p. 201.
*Heparin Administration: Methods and Results in Thirty Cases. C. R. Lam, Detroit.—p. 205.
*Pectin Solution as Blood Substitute. F. W. Hartman, V. Schelling, H. N. Harkins and B. Brush, Detroit.—p. 212.
Cancer of Lip. H. Martin, W. S. MacComb, New York, and J. V. Blady, Philadelphia.—p. 226.
Observations on Prevention and Treatment of Postoperative Atelectasis and Bronchopneumonia. C. Haight and H. K. Ransom, Ann Arbor, Mich.—p. 243.
Roentgen Ray Treatment of Gas Gangrene: Clinical and Experimental Observations. G. A. Caldwell and F. J. Cox, New Orleans.—p. 263.
Conservative Amputation of Gangrenous Parts by Chemosurgery. F. E. Mohs, E. L. Sevringhaus and E. R. Schmidt, Madison, Wis.—p. 274.
Plan for Study of War Wounds. F. L. Meloney, New York.—p. 283.
Procaine Injection and Early Mobilization in Treatment of Non-Weight Bearing Fractures. L. K. Ferguson and W. H. Erb, Philadelphia.—p. 293.
Three Years' Experience with Vitallium in Bone Surgery. C. S. Venable and W. G. Stuck, San Antonio, Texas.—p. 309.

Evacuation and Hospitalization in War.—Lyle states that the active army surgeon is a tried veteran whose surroundings but not his work change during action. For cooperation the civilian surgeon must slough off the attitudes of the lone wolf and the commanding general and accept the vital military principle of coordinate control. An army with poor evacuation service cannot have a strong morale, and a good evacuation system requires the utmost in cooperation. The evacuation hospital is the core of the evacuation system. It is the responsibility of the surgical director and the surgical teams to see that a bottleneck does not occur. To this end airplane evacuation will probably become a valuable asset. Every evacuation hospital personnel should be thoroughly trained in the functioning of the lightly wounded production line. The first requisite is an ample floor space. If it is not obtainable in permanent buildings, well arranged tentage is ideal. The most difficult ambulance problem in a big offensive is even distribution of the wounded to army hospitals. This is possible only when close coordination exists between the directors of the corps and army ambulances and the evacuating officer of the army hospitals. In the last war all deficiencies in divisional ambulances were aided through lending sections to the corps, and in addition a section from the army reserve was attached to each corps to take care of its local emergencies. The secondary duties of an ambulance service are to maintain a motor courier service for liaison purposes, to ration trains, to forward medical

supplies and the like. The army consulting service should have definite plans prepared to meet any offensive, weighing the effect of its policies on evacuation and hospitalization. The army consultant must be more than an individual diagnostician: his vision cannot be dimmed by specialism. Large hospitals are not necessary for the nontransportable wounded. A small hospital of about fifty beds and two surgical teams is best, provided the hospital is limited to this type of case. The basic principle of all military surgery is débridement; chemotherapy and immobilization are adjuncts.

Heparin Administration.—Lam states that during the last two years 30 patients were given heparin for the following conditions: 24 for postoperative embolism which was not immediately fatal, 3 for embolism of a peripheral artery with embolectomy, 1 for syphilitic thrombosis of the posterior tibial artery, 1 for hemiplegia from occlusion of the common carotid artery and 1 for phlebitis. Twenty-two of the 24 patients with embolism recovered. One of the 2 deaths apparently represents a failure of heparin in the dosage used. The circulation was restored to the legs of 2 of the embolectomy patients; the third lived only a few hours after an attempted removal of clots from the femoral artery. No flow of blood was obtained, and the grave condition of the patient, who was in the terminal stages of arteriosclerotic heart disease and probably also had mesenteric embolism, caused the operation to be interrupted without an abdominal approach to the iliac artery. A gratifying result was obtained in the patient with the syphilitic thrombosis, and the patient with phlebitis showed transient amelioration. The patient with hemiplegia died. Heparinization did not appear to be of any benefit. There was 1 case of concealed hemorrhage. An obese woman of 43 had a spinal fusion. During the third week of convalescence, she had several small pulmonary embolisms. Heparin was begun by continuous intravenous cannula, and, because a bone graft had been removed from the right leg, the left one was chosen. The clotting time was maintained at the optimal level by giving 1,000 units of heparin per hour. On the third day of treatment the patient complained of severe pain about the femoral vessels of the left leg. The leg was repeatedly examined, but no cause for the pain could be found. Later she complained of feeling faint. The true state of affairs was recognized only three days later, when bulging because of the development of a huge hematoma was noted. The hemoglobin determination at this time showed 5 Gm., or 33 per cent, the vitamin C level was 0.2 mg. and the tourniquet test indicated capillary fragility. Apparently the combination of the two hemorrhagic tendencies resulted in the subcutaneous bleeding. Heparin has a place in the treatment of thrombosis, but it should not be used indiscriminately.

Pectin Solution as Substitute for Blood.—Hartman and his associates point out that the present emergency reemphasizes the problem of obtaining large quantities of human blood and blood plasma. They believe that some substitute for blood and blood plasma must be found. They suggest the use of pectin intravenously. The authors experimented with two pectins in the form of a dry powder. They dissolved the pectins in warm double distilled water to make a 1 per cent solution and then sterilized the solutions under steam pressure of 15 pounds for twenty minutes. After sterilization the solutions were still slightly opalescent and were further buffered to pH 7.2. Each lot must be tested against citrated blood and suspensions of erythrocytes, and hemolysis, rapid sedimentation and precipitation of fibrin must be looked for. If any of these occur, the solution cannot be used. To determine whether or not pectin was anaphylactoid or toxic to the body or its component units the solution was injected into normal animals (guinea pigs, rabbits and dogs) and to animals in shock following hemorrhage and experimental bile peritonitis. No reaction in the normal animals or prompt and adequate response in the other animals, as measured by blood pressure graphs and the general condition, was obtained. Preliminary clinical application showed that bleeding time, coagulation time and liver function of a patient not in shock with a moderate elevation of blood pressure after 600 cc. of 1 per cent buffered pectin solution were not altered. A mastectomy patient in shock was given 450 cc. of the solution and her condition improved steadily for three hours. Satisfactory blood pressure levels were maintained throughout

in 2 patients given injections of the pectin solution during partial gastrectomy. Three other patients undergoing operations and 1 normal person given pectin intravenously experienced no reactions or untoward results. In these 3 patients no variation from the normal was observed in the bleeding time of the tissues of the operative wound. The authors believe that pectin is a logical substitute for blood. It is one of the most hydrophilic colloids; only 0.5 Gm. of it is required for each hundred cubic centimeters of a solution having a viscosity and osmotic pressure similar to whole blood. The source of pectin—citrus fruits—its production and chemical and electrolytic extraction make an abundant supply easily and readily available.

Archives of Internal Medicine, Chicago

68:181-374 (Aug.) 1941

- Multiple Fresh Coronary Occlusions in Patients with Antecedent Shock. H. L. Blumgart, M. J. Schlesinger and P. M. Zoll, Boston.—p. 181.
- *Differentiation of Intrahepatic and Extrahepatic Jaundice: Response of Plasma Prothrombin to Intramuscular Injection of Menadione (2-Methyl-1, 4-Naphthoquinone) as Diagnostic Aid. J. W. Lord Jr. and W. D. Andrus, New York.—p. 199.
- *Treatment of Pneumococcal Meningitis with Sulfanilamide and Sulfapyridine: Statistical Study of All Reported Cases in Which Chemotherapy Was Used, With or Without Specific Antipneumococcus Serum. C. W. Steele and J. Gottlieb, Lewiston, Maine.—p. 211.
- Origin of Blood Amylase and Blood Lipase in Dog: Relation Between Blood Amylase and Urinary Amylase Following Induction of Uranium Nephritis. D. L. Dozzi, Philadelphia.—p. 232.
- Clinical and Physiologic Characteristics of Chills. G. A. Perera, New York.—p. 241.
- Studies on "Essential" Hypertension: II. Association of Hypertension with Organic Renal Disease. H. A. Schroeder and J. M. Steele, New York.—p. 261.
- Blood Picture in Chickenpox. A. A. Holbrook, Milwaukee.—p. 294.
- Hepatic Function in Patients with Amyloidosis. A. M. Tiber, A. W. Pearlman and S. E. Cohen, New York.—p. 309.
- Infectious Diseases: Review of Significant Publications in 1940-1941. H. A. Reimann, Philadelphia.—p. 325.

Jaundice.—Lord and Andrus suggest that the response of plasma prothrombin to menadione intramuscularly presents a valuable aid for the differentiation of intrahepatic from extrahepatic jaundice. They treated 28 jaundiced patients with menadione and determined the response of the plasma prothrombin to it. In 18 jaundice was of the extrahepatic type (10 with common duct stone or cholangitis, 5 with carcinoma of the head of the pancreas and 3 with stricture of the common duct) and in 10 it was of intrahepatic origin. The diagnosis in 17 of the 18 patients was proved at operation, while in the eighteenth acute cholecystitis and gallstones were later demonstrated by the Graham test; the transient jaundice was apparently due to cholangitis. This last patient refused to undergo operation. Of the 10 patients with intrahepatic jaundice, 4 died and necropsies were performed, 3 were operated on and the course of the disease in 2 of the remaining 3 was typical of catarrhal jaundice, while the third is thought to have cirrhosis of the liver with hepatic insufficiency. This patient is still alive and has not been operated on. There was a net rise of from 10 to 62 per cent in the plasma prothrombin of 17 of the 18 patients with extrahepatic jaundice following intramuscular injection of menadione. The response of the other patient was only 8 per cent in seventy-two hours. This patient was operated on immediately after the initial prothrombin determination, and the trauma of cholecystectomy and choledochotomy may well have been responsible for this small response. In contrast the greatest single response among the 10 patients with intrahepatic jaundice was a rise of 10 per cent in a patient with subacute hepatitis. As the method has been uniformly accurate it merits further consideration in the differential diagnosis of jaundice.

Pneumococcal Meningitis.—Steele and Gottlieb present evidence which suggests that the abandonment of sulfanilamide and azo derivatives in the treatment of pneumococcal meningitis may have been erroneous. They state that of 48 such patients treated with sulfanilamide and azo derivatives 68.75 per cent (33) recovered and 31.25 per cent (15) died, whereas of 67 similar patients treated with sulfapyridine only 53.7 per cent (36) recovered and 46.2 per cent (31) died. If all patients who died during the first twenty-four hours are excluded, the respective percentage of recoveries becomes 71 and 62.7. Sulfapyridine was more effective than sulfanilamide and azo deriva-

tives for type III pneumococcus meningitis. Type specific antipneumococcus serum in conjunction with chemotherapy did not materially lower the mortality rate of pneumococcal meningitis. As sulfanilamide is a safer drug, is more readily and uniformly absorbed and is as effective as or even more effective than sulfapyridine or sodium sulfapyridine for pneumococcal meningitis its use should be continued until either of the other two drugs is shown to be superior.

Archives of Ophthalmology, Chicago

26:165-340 (Aug.) 1941

- Chronic Dacryocystitis: Its Causation and Treatment. H. M. Traquair, Edinburgh, Scotland.—p. 165.
- Ocular Fundus in Diabetes Mellitus. R. H. Lee, Honolulu, Territory of Hawaii.—p. 181.
- Dark Adaptation: Some Physiologic and Clinical Considerations. J. Mandelbaum, Brooklyn.—p. 203.
- Recession of Retinal Papilledema During Terminal Stage of Malignant Hypertension: Report of Case. N. M. Keith, C. W. Rucker and Edith M. Parkhill, Rochester, Minn.—p. 240.
- Treatment of Herpetic Keratitis with Ether. B. Kronenberg, New York.—p. 247.
- Pathology of Acute Glaucoma. L. Hess, Boston.—p. 250.
- Orthoptics: Clinical Evaluation of Recent Advances. M. C. Wheeler, New York.—p. 260.
- Suiting the Cylinder to the Mirror in Retinoscopy. J. I. Pascal, New York.—p. 265.
- Gonorrheal Ophthalmia: Treatment with Sulfanilamide Derivative and Injections of Milk. O. S. Lee Jr. and F. K. Lum, Shanghai, China.—p. 268.
- Effect of Oxygen Deprivation and Strychnine Administration on Visual Function: Study of Angiosclerotic. C. P. Seitz and C. M. Rosenthal, Brooklyn.—p. 276.
- "Foster Kennedy" Syndrome: Footnote to Ophthalmologic History. P. Fridenberg, New York.—p. 288.
- Divergence Impulse. F. H. Haessler, Milwaukee.—p. 293.

Archives of Otolaryngology, Chicago

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- Closure of Operative Fenestras in Labyrinth. E. P. Fowler Jr., New York.—p. 209.
- Sphenoid Sinus: Anatomic Study, with Consideration of Clinical Significance of Structural Characteristics of Sphenoid Sinus. O. E. Van Alyea, Chicago.—p. 225.
- Primary Carcinoma of External Auditory Canal and Middle Ear: Review of Literature; Report of Case of Cystic, Adenoid Epithelioma (Brooke's Tumor) of External Auditory Canal. J. C. Peele and G. H. Hauser, New Orleans.—p. 254.
- Paralysis and Paresis of Vocal Cords: Statistical Review. W. P. Work, Ann Arbor, Mich.—p. 267.
- *Group: Preliminary Report on One Year's Investigation of 226 Cases. J. G. Gilbert, H. Meyersburg and J. S. Silverberg, Brooklyn.—p. 281.
- *Significance of *pu* of Nasal Secretions in Situ: Further Studies. N. D. Fabricant, Chicago.—p. 297.
- *Effect of Silver Preparations and Antiseptics on *pu* of Nasal Secretions in Situ. N. D. Fabricant, Chicago.—p. 302.
- The Deformed Nose. S. L. Scher, New York.—p. 307.
- Mucocoele of Frontal Sinus: Report of Case. W. W. Wilkerson Jr., Nashville, Tenn.—p. 321.
- Paranasal Sinuses: Review of Literature for 1940. S. Salinger, Chicago.—p. 358.

Croup.—According to Gilbert and his associates, during the year beginning April 1, 1939 there were encountered at the Kingston Avenue Hospital 226 cases of croup; 16 were of the diphtheritic and 210 of the nondiphtheritic type. Despite the tremendous decrease in diphtheritic croup, nondiphtheritic croup has remained about the same. The multiplicity of names for croup is confusing, and failure to standardize the nomenclature constitutes a challenge to those caring for these patients. The authors offer the following classification: (1) diphtheritic croup with three subgroups (diphtheritic obstructive laryngitis, laryngotracheitis and laryngotracheobronchitis) and (2) nondiphtheritic croup with five subgroups (acute catarrhal laryngotracheitis, supraglottic edematous obstructive laryngitis, subglottic obstructive exudative and edematous laryngitis and tracheitis, acute obstructive laryngotracheobronchitis and an unclassified noninfectious croup due to allergy, foreign body and chemicals or other irritative agents). The presence or absence of supraglottic edema and the position and motion of the vocal cords before and after suctioning of the subglottic area and the trachea have furnished the authors a dependable guide to the choice of therapy. They found it necessary to use the laryngoscope in more than 30 per cent of their cases. For croup of the supraglottic obstructive type, tracheotomy is the logical

treatment, for the subglottic exudative type suction, for the subglottic edematous type tracheotomy and for acute obstructive laryngotracheobronchitis tracheotomy followed by repeated bronchoscopic suctioning through the wound. The incidence of morbidity and mortality is affected by the occurrence of *Staphylococcus aureus* hemolyticus and by complicating bronchopneumonia, which was present in 25 per cent of the authors' cases.

The p_H of Nasal Secretions in Situ.—Fabricant believes that an excellent nasal vasoconstrictor is 1 per cent ephedrine hydrochloride in physiologic solution of sodium chloride, with a p_H of 5.9. The generally recognized therapeutic measures for patients with acute rhinitis or acute rhinosinusitis are sufficient rest, adequate sleep and external heat for the relief of pain. Each of these measures produces uniformly a single nasal p_H phenomenon—acidity. If an operation is required later, when the acute symptoms disappear and the nasal p_H range is restored to a normal, slightly acid status, it will be performed at an elective time in a completely acid nasal environment. In view of the significance of the p_H of nasal secretions in situ it is suggested that every nasal vasoconstrictor prescribed and sold should satisfy two basic physiologic requirements: 1. It should restore and maintain normal ciliary activity. 2. It should be slightly acid with a p_H value within the normal p_H range of nasal secretions in situ; i. e., between 5.5 and 6.5. The ciliary factor without the p_H factor is but half of the problem of applied nasal physiology.

Effect of Antiseptics on p_H of Nasal Secretions.—Fabricant points out that silver preparations which enhance or perpetuate the alkalinity of nasal secretions found in acute rhinitis and acute rhinosinusitis prolong the undesirable alkaline status in which bacteria producing acute inflammation find a fertile field for growth. Therefore, during acute rhinitis and acute rhinosinusitis the use of silver preparations which lower the p_H to between 5.5 and 6.5 is most desirable. Silver preparations standardized to a p_H level between 5.5 and 6.5 could produce this effect. Silver preparations with such p_H improvement would bring about an entirely new conception of their relationship to the ciliary factor. Because of their inherent alkalinity, metaphen 1:2,500 and 1:500, merthiolate 1:1,000 and 1:5,000 and mercurochrome from 0.25 to 2 per cent convert the normal slightly acid nasal status to an alkaline status. During acute rhinitis and acute rhinosinusitis these solutions superimpose additional alkalosis on an already abnormally alkaline nasal mucous membrane. This is undesirable. Mercresin in a dilution of 1:5 satisfies the p_H standards of nasal secretions in situ.

Canadian Medical Association Journal, Montreal

45:101-200 (Aug.) 1941

- *Retention of Wheat Vitamins in Flour and Bread, a Problem of National Importance. F. F. Tisdall, S. H. Jackson, T. G. H. Drake, Toronto; L. H. Newman, A. G. O. Whiteside, H. Miller and J. Edgar, Ottawa, Ont.—p. 101.
- Epilepsy. D. McEachern, Montreal.—p. 106.
- Spontaneous Cardiac Rupture. E. J. Simburg, Brandon, Man.—p. 112.
- Chemotherapy and Experimental Gas Gangrene. A. R. Armstrong and M. Viola Rae, Hamilton, Ont.—p. 116.
- *Prognosis in Rheumatic Heart Disease. J. D. Keith, Toronto.—p. 119.
- Examination of Fundus in 2,360 Diabetics. S. H. McKee, Montreal.—p. 127.
- Nitritoid Crisis Following Injection of Tryparsamide. H. Lehmann, Montreal.—p. 129.
- Hypertensive Heart Disease. A. B. Walter, Cambridge, N. B.—p. 130.
- Inguinal Hernia. E. S. Hicks, Brantford, Ont.—p. 134.
- Some Observations on Maternal Welfare. F. W. Jackson, Winnipeg, Man.—p. 137.
- Simple Method for Transmission and Reproduction of Electrocardiograms. C. K. Stuart, London, Ont.—p. 140.
- Survey of Goiter Situation in Southern Saskatchewan. H. L. Jackes, Regina, Sask.—p. 142.
- Abnormal Intravenous Glucose Tolerance in Liver Disease. R. Wilson, with technical assistance of Mary Gibson, Vancouver, B. C.—p. 147.
- Ear Injuries. A. A. Campbell, Toronto.—p. 152.
- Carcinoma of Urethra: Two Cases. J. E. Nichol, Toronto.—p. 155.

Vitamins in Flour.—Tisdall and his colleagues state that, according to the dietary surveys just completed in Halifax, Quebec, Toronto and Edmonton, one of the most serious deficiencies found in Canadians is lack of vitamin B₁. As a deficiency of one member of the vitamin B complex is almost invariably accompanied by a deficiency of some of the other

members of the complex, the Canadian's concern is not only with an adequate supply of thiamine but also with the other members of the complex. The concern is not with the infrequent occurrence of rickets, tetany, scurvy, beriberi and pellagra but with the many symptoms of ill health due to the suboptimal intake of the vitamin B complex. The signs and symptoms are moodiness, sluggishness, indifference, fear and mental and physical fatigue. Whole wheat is the richest food source of vitamin B₁, and is also a good source of most of the other members of the vitamin B complex. As the Canadian people will not as a nation consume whole wheat bread, the problem of increasing the intake of the vitamin B complex resolves itself into its retention or restoration in white flour. With the information that the endosperm of wheat must be added to white flour and the cooperation of certain millers, a milling technic has been developed which results in the production of a flour similar in appearance to ordinary bakers' white flour yet one which retains from 50 to 65 per cent of the vitamin B₁ originally present in wheat and an increased amount of other members of the B complex. The use of this flour by Canadians would increase their daily dietary supply of vitamin B₁ alone by 100 to 150 units per person. If such flour was used generally in Canada in place of the ordinary white flour, many millions of dollars' worth of the various members of the vitamin B complex at present discarded in the milling process would be saved for human consumption at no cost to the people of Canada. It would place white bread in the "protective" class of foods. This would justify an increased use of bread made from Canadian wheat, with a resultant improvement in the agricultural and economic life of the nation. This dietary change alone should prove to be a real factor in improving the health of the nation.

Rheumatic Heart Disease.—According to Keith, rheumatic fever would be an insignificant disease if it did not involve the heart. The prognosis in a rheumatic individual depends on whether or not carditis is likely to develop. The type of rheumatic manifestation can suggest the likelihood of the development of future heart disease and its severity. The chief manifestations of rheumatic disease in children are arthritis, chorea and nodules. The least common is the nodule, but it is associated with the most severe forms of the disease, as 99 per cent of such patients also have heart disease, which is usually progressive. Heart disease develops in about 80 per cent of rheumatic patients with arthritis, in 50 per cent of those with pure chorea, in 15 per cent of those with chorea but no other rheumatic manifestations, and in 70 per cent of those with chorea and other manifestations of rheumatic fever. Heart disease develops in from 30 to 50 per cent of adults with rheumatic arthritis. Of patients who have had rheumatic manifestations but no heart disease, rheumatic heart disease will develop subsequently in 25 per cent of children and in 5 per cent of adults. About 75 per cent of children have one or more recurrences of rheumatic infection within five years of its onset. In about 70 per cent of adults with rheumatic heart disease the lesion is slowly progressive whether it is obviously or obscurely active. The mortality in rheumatic heart disease for children is as follows: Four per cent die in the first attack, 12 per cent in the first five years and from 20 to 30 per cent within ten years of the onset of heart disease. Among the adult clinic patients 40 per cent die in ten years and 75 per cent in twenty-three years. In at least 10 per cent, definite clinical signs of rheumatic valvular disease disappear over the subsequent ten years. The morbidity for children is stated as 80 per cent leading an ordinary life five years after onset (Schlesinger), 59 per cent in from three to fifteen years (Stroud) and 51 per cent ten years after onset (Jones). Factors influencing the prognosis are progressive disease, increase in heart size, progressive valve damage, pericarditis, nodules and valvular lesions. The larger the heart, the shorter the survival. The prognosis is better when continuously supervised treatment is begun early in a hospital. There is evidence of an approximately 25 per cent mortality reduction in the last fifteen years. Widespread interest in the disease would decrease the mortality much further.

Illinois Medical Journal, Chicago

79:441-522 (June) 1941

- Organization and Medicine. J. S. Templeton, Pinckneyville.—p. 451.
Menstrual Disorders During Adolescent Period. R. E. Campbell, Madison, Wis.—p. 454.
Cancer and Precancerous Lesions of Lip. F. E. Simpson, Chicago.—p. 459.
Nephritis in Children. J. K. Calvin, Chicago.—p. 464.
Importance of Growth Arrest Lines in Radiologic Diagnosis and Prognosis. J. A. Siegling, Urbana.—p. 468.
Clinicopathologic Conference. E. F. Hirsch and C. A. Johnson, Chicago.—p. 470.
Early Diagnosis of Poliomyelitis. S. O. Levinson, Chicago.—p. 475.
Diagnosis and Management of Early Tuberculosis. R. Bosworth, East St. Louis.—p. 477.
Pregnancy and Tuberculosis. F. M. Meixner, Peoria.—p. 482.
Results in Treatment of Pulmonary Tuberculosis. J. R. Head, Chicago.—p. 486.
Traumatic Rupture of Tendon Achilles: Report of Two Cases. L. T. Gregory, Urbana.—p. 493.
Radium Treatment of Persistent Nose Bleeding. R. L. Moter, Albion.—p. 494.
New Syndrome of Corpus Lutein Deficiency. L. E. Day, Chicago.—p. 495.
Operative Treatment of Carcinoma of Esophagus. D. B. Phemister, Chicago.—p. 497.
Use and Abuse of Chemotherapy in Obstetrics and Gynecology. F. L. Adair, H. C. Heschline and Lucile R. Hac, Chicago.—p. 500.
The Aging Heart. J. H. Musser, New Orleans.—p. 510.

80:1-88 (July) 1941

- Prevailing Medical Problems in Illinois: President's Address. C. H. Phifer, Chicago.—p. 12.
Differential Diagnosis in Acute Anterior Poliomyelitis. S. O. Levinson, Chicago.—p. 13.
Immediate Care of Industrial Injuries. T. C. Douglass, Chicago.—p. 15.
Fractures of Lower Forearm and Wrist. R. J. Bennett Jr., Chicago.—p. 17.

80:89-176 (Aug.) 1941

- *The Surgeon and the Ulcer Problem. O. H. Wangenstein, Minneapolis.—p. 100.
Medical Care of Social Security Clients. C. H. Phifer, Chicago.—p. 110.
Coronary Disease and the Doctor. O. P. J. Falk, St. Louis.—p. 115.
General Principles of Behavior Problems in Children. B. I. Beverly, Oak Park.—p. 120.
Orthopedic Treatment of Infantile Paralysis. P. Lewin, Chicago.—p. 124.
Pathogenesis of Subacute Bacterial Endocarditis. H. D. Palmer, Rockford.—p. 129.
*Bilateral Oophorectomy in Early Pregnancy. W. R. Young, Geneseo.—p. 132.
General Medicine in Mental Hospital. E. Liebert, Elgin.—p. 133.
Eye Problems in Graves' Disease. J. H. Means, Boston.—p. 135.
Recent Progress in Estrogen Therapy. S. C. Freed, Chicago.—p. 139.
*Rat-Bite and Haverhill Fevers. T. Kirkwood, Lawrenceville, and C. G. Stoll, Sumner.—p. 141.
Clinical Approach to Roentgen Diagnosis of Carcinoma of Colon. J. T. Case, Chicago.—p. 145.
Roentgenographic Considerations of Some Aspects of Chronic Mastoiditis, with Special Reference to Cholesteatoma. J. H. Gilmore and L. D. Urban, Chicago.—p. 153.
Some Problems of Biliary Tract Surgery. I. S. Ravdin, Philadelphia.—p. 158.

Peptic Ulcers.—Wangenstein states that inability to control gastric acidity is the chief cause of failure in the medical management of patients with ulcer. Night secretion contributes materially to the failure to control gastric acidity by diet. Effective reduction of gastric acidity is the chief criterion of an acceptable operation. Anastomotic operations fail to reduce gastric acidity. The most acceptable procedure appears to be resection of three fourths of the stomach, in which the pylorus and antrum, accompanied by a satisfactory gastrojejunal anastomosis, are sacrificed. Gastrojejunal union after resection is established by the closed (aseptic) method of anastomosis; the Hofmeister operative plan is preferred by the author. The anastomosis is made in an antiperistaltic fashion and is invariably retrocolic. Consistent achlorhydria has been achieved in 65 per cent of patients after resecting three fourths of the stomach and excising the antrum; 80 per cent have been achlorhydric on all but one examination. No recurrent ulcers have followed this type of operation. No dietary restraints are imposed on these patients, and they are restored to useful activity. Experience at the author's clinic suggests that the operation may be done for ulcer and its complications (exclusive of perforation) with an operative risk of 2 per cent. Caloric and nitrogen equilibrium must be maintained preoperatively and postoperatively by intravenous feeding. The poor risk patient

with obstruction at the gastric outlet may be prepared for operation and have the one stage procedure performed. The acceptance of these measures will extend the accomplishments of surgery to poor risk patients without increasing the operative risks.

Bilateral Oophorectomy in Early Pregnancy.—Young reports the case of a 31 year old woman presenting symptoms and signs of an acute condition within the abdomen. The previous history was negative except that four years before she delivered a 7 months macerated fetus; a year later she became pregnant again, went to full term and delivered a living child. The present tentative diagnosis was ruptured ectopic pregnancy. A twisted ovarian cyst was found at operation and was removed. The opposite ovary was diseased and was likewise removed. The uterus was small; her last menstrual period was only two weeks overdue, making the diagnosis of pregnancy questionable. Recovery from the operation was uneventful. One month later the patient complained of nausea and vomiting. She was next seen about four and a half months after her last menses; at this time the patient noted quickening, the uterus was enlarged and Hegar's and Chadwick's signs were positive, but no definite fetal heart sounds were heard, although there was a loud funic souffle. Parturition took place about eleven days after the expected confinement date. A normal female child was delivered spontaneously. The placenta was normal. Lactation was slight, but this was also true with the first baby. About a year later the patient was again seen: she remained amenorrheic. The uterus was normal in size and shape, and there was no apparent atrophy. When the bilateral oophorectomy was performed, pregnancy could not have been present more than about thirty-five days, making the case one of the earliest of its kind to be reported.

Rat-Bite and Haverhill Fevers.—Kirkwood and Stoll call attention to the fact that rat-bite fever and Haverhill fever have occurred in Illinois and should be considered in fevers of obscure origin. They report 3 cases; in 2 the clinical diagnosis was spirillar rat-bite fever and in 1 sporadic Haverhill fever following a rat bite. The first disease is most likely caused by *Spirillum minus* and the other by *Haverhillia multiformis*. If this is correct it helps to explain the different clinical and laboratory observations. In rat-bite fever the wound caused by the bite usually heals by first intention. After an incubation period of from five to twenty-five days the initial wound becomes red and painful, blisters and eventually ulcerates. The ulcer often resembles an extragenital chancre and heals slowly. Pus in the discharge often indicates that some other organism is causing the disease or is acting as a secondary invader. These local changes are accompanied by a regional lymphangitis similar to that seen in tularemia. A severe chill, accompanied by generalized muscular aches and pains, occurs about the time the local changes are noticed. The temperature rises rapidly to 104 or 105 F., lasts two or three days and then drops quickly to normal or below and is followed by drenching perspiration. The chills recur at intervals of three or four days to a week and may continue for months if the disease is not recognized and treated properly. After each chill typical large, reddish purple, maculopapular spots appear on the skin. As the fever subsides after each chill the spots fade but return after the next chill. Between chills the patient may feel well but, as the disease continues, weakness and emaciation become more definite until in unfavorable cases exhaustion supervenes. The reported mortality varies from 2 to 10 per cent. In sporadic Haverhill fever (*Haverhillia multiformis* septicemia) the rat bite usually heals promptly and shows little if any reaction. After an incubation period of from three to five days, invasion begins. The onset is sudden and generally severe. Nausea and vomiting are early complaints. Other prominent symptoms are chills, backache, general muscular pain and headache. The initial fever may reach 105 or 106 F. and frequently causes delirium. This fever falls abruptly sometime during the following two to five days. The patient often feels well enough to get out of bed and may even return to work. A rubellaform to morbilliform rash usually appears on the second, third or fourth day of the disease. It lasts from one to eight days, and desquamation may follow. A secondary rise in temperature occurs in from one to three days after the initial fever drops and is quickly followed

by a polyarthritis on the fourth or fifth day of the disease. It may persist for weeks or months; the temperature curve is similar to that seen in typhoid, only the daily variations are greater. During this period the disease is easily confused with acute rheumatic fever. Some patients have bronchitis. The death rate is unknown but is very low. Haverhill fever may or may not follow an animal bite, and epidemics from contaminated food may occur.

Indiana State Medical Assn. Journal, Indianapolis

34:355-406 (July) 1941

- Treatment of Parkinson's Disease with Pyridoxine Hydrochloride (Vitamin B₆ Hydrochloride): Preliminary Report. C. L. Rudesill and C. G. Weigand, Indianapolis.—p. 355.
Hyperostosis of Calvarium: Preliminary Report. C. L. Williams, Logansport.—p. 361.
Appendicitis with Multiple Abscess of Liver and Other Complications with Recovery. J. K. Berman and H. L. Egbert, Indianapolis.—p. 365.
The Consultant. E. O. Asher, New Augusta.—p. 370.
Endometrial Tissue in Inguinal Hernia: Report of Case. S. J. Donovan, Michigan City.—p. 372.
Bright's Disease. I. H. Page, Indianapolis.—p. 374.

34:407-446 (Aug.) 1941

- Infantile Diarrhea. E. H. Carleton, East Chicago, and H. J. Ryan, Gary.—p. 407.
Neuropsychiatric Examinations in Selective Service. E. W. Mericle, Fort Benjamin Harrison.—p. 410.
Influence of Culture Mediums on Antigenic Properties of Haemophilus Pertussis. H. M. Powell and W. A. Jamieson, Indianapolis.—p. 413.
Postencephalitic Tic of Diaphragm. P.-G. Skillern, South Bend.—p. 414.
Rupture of Infarcted Granulosa Cell Tumor of Ovary with Massive Hemorrhage. A. C. Bach, Indianapolis, and M. M. Montgomery, Chicago.—p. 421.
Arteriosclerosis. J. B. Maple, Sullivan.—p. 424.

Journal of Pediatrics, St. Louis

19:147-288 (Aug.) 1941

- Children's Reactions to Movie Horrors and Radio Crime. Mary I. Preston, San Francisco.—p. 147.
Studies on Growth and Development of Male Children Receiving Evaporated Milk: I. Effect of Various Vitamin Supplements on Growth in Length and Incidence of Rickets During First Two Years of Life. Teresa Folin Rhoads, M. Rapoport, Ruth Kennedy and J. Stokes Jr., Philadelphia.—p. 169.
Intake of Amino Acids by Breast Milk Fed Infants and Amino Acid Composition of Cow's Milk and Human Milk. E. F. Beach, S. S. Bernstein and Icie G. Macy, Detroit.—p. 190.
*Sydenham's Chorea: Preliminary Report of Three Cases Successfully Treated with Vitamin B₆. J. Schwartzman, D. Dragutsky and G. Rook, Brooklyn.—p. 201.
*Coagulation Defects in Infancy and Childhood: Frequency of Hypoprothrombinemic States and Their Treatment with Vitamin K: Reclassification of Hemorrhagic Hypoprothrombinemia Neonatorum. A. M. Grossman, Washington, D. C.—p. 205.
*Tellurite Reaction: Further Study on 100 Consecutive Cases at Steele Memorial Hospital. G. P. Lingenfelter and B. T. Daniels, Denver.—p. 218.
Rhabdomyosarcoma: Case Report. J. A. Danciger, Memphis, Tenn., and J. Warren, Detroit.—p. 223.
Parapertussis: Clinical and Serologic Observations. J. J. Miller Jr., T. M. Saito and R. J. Silverberg, San Francisco.—p. 229.
Nutritional Obesity in Children in Private Practice. C. G. Kerley and E. J. Lorenze, New York.—p. 241.
Restraint for Small Children. C. H. Smith, New York.—p. 245.

Vitamin B₆ for Sydenham's Chorea.—Schwartzman and his associates used vitamin B₆ (pyridoxine hydrochloride) for the treatment of 3 patients with Sydenham's chorea. The amount of the preparation necessary for a satisfactory response for each of the 3 patients was 180, 425 and 840 mg., respectively. Improvement was not discernible until the patient had been under treatment for several days, and it was gradual at first; the intensity of involuntary movements was diminished and a feeling of general comfort and restfulness followed. Once improvement began, the amelioration of symptoms was progressively increased. No reactions were encountered. The simplicity of the treatment lends itself to home care. The dramatic response of these patients to vitamin B₆ suggests that one of the etiologic factors in chorea may be a vitamin deficiency. Preliminary reports of cures should not be accepted until full verification is had from additional reports.

Coagulation Defects.—Grossman reports 21 instances of coagulation disorders in newborn infants and in children up to 10 years of age who were admitted to the Children's Hospital for prothrombin studies. The cases represent a cross section

of an average children's hospital. The diagnoses of the various bleeding disorders were substantiated by laboratory tests. The patients were usually given 2,000 Ansbacher units, twice a day, of synthetic aqueous vitamin K by hypodermic injection. There were 4 infants with neonatal hemorrhagic hypoprothrombinemia, 3 with hepatic damage, 2 with hepatic damage incident to congenital syphilis, 2 with congenital gastrointestinal obstruction, 4 with hemophilia, 1 with acute myeloblastic leukemia, 1 with idiopathic nonthrombocytic purpura and 4 with intracranial hemorrhage. Many of the children with a defective clotting mechanism did not have hypoprothrombinemia. About 43 per cent of the hemorrhages were associated with some degree of hypoprothrombinemia. Hemorrhage due to a depression of prothrombin is common and should be considered in the differential diagnosis. The various disorders resulting in hypoprothrombinemia are classified into hepatic damage and vitamin K deficiency brought about by faulty absorption or dietary deficiency in newborn infants. The etiology of the latter is subdivided into physiologic hypoprothrombinemia, hemorrhagic disease of the newborn infant and prolonged vomiting of the newborn infant. The cause of physiologic hypoprothrombinemia of the infant is failure of the fetus to store sufficient prothrombin for use during the first twenty-four hours of life. Bacterial synthesis in the gastrointestinal tract, which begins when the infant is first fed, produces enough vitamin K to begin the elaboration of prothrombin. Consequently, earlier feeding of infants is recommended. The author believes that 2,000 Ansbacher units of vitamin K daily for two days hypodermically will usually protect the infant from neonatal hypoprothrombinemia. The premature baby should be given the vitamin K for two more days. For other hemorrhagic diseases 2,000 units twice a day until the prothrombin concentration has returned to normal will be adequate.

Tellurite Reaction.—According to Lingenfelter and Daniels, 100 consecutive patients exhibiting faucial or pharyngeal membranes, when admitted to the hospital for whatever cause, were subjected to the tellurite test. The results of the test were as follows: Forty-eight had true positive, 21 true negative, 2 undetermined, 6 indefinite, 16 false negative and 7 false positive reactions. A reaction was considered positive when the culture, the clinical impression and the tellurite test coincided with the diagnosis of acute pharyngeal diphtheria membrane. The data show that 23.5 per cent of 68 patients (including the 16 with false negative reactions and 4 of those with indefinite reactions) who were finally diagnosed as having acute diphtheria would have been missed if reliance had been put only on the tellurite test. Ten of these patients had the typical diphtheria odor. If only the test had been relied on, the 7 patients with the false positive reactions would have needlessly been given antitoxin. The authors believe that sixteen false negative tests among one hundred consecutive tests are a sufficient number to disqualify Manzullo's method almost completely. The final diagnosis in any case presenting a pharyngeal membrane should not be based on the tellurite test alone. Experienced practitioners away from laboratory facilities could rely as confidently on the typical odor of diphtheria as on the reaction of the tellurite test. The clinical impression and the bacteriologic culture should not be supplanted by this test.

Kansas Medical Society Journal, Topeka

42:281-324 (July) 1941

- Problem of Controlling Tuberculosis. J. E. Dailey, Houston, Texas.—p. 281.
Sudden Heart Death. P. W. Morgan, Emporia.—p. 285.
Cobra Venom Analgesia in Surgery. P. E. Craig, Coffeyville.—p. 289.
Effect of Anesthetics on Liver. Gretchen Guernsey and P. H. Lorhan, Kansas City.—p. 293.

Maine Medical Association Journal, Portland

32:187-204 (Aug.) 1941

- Special Problems in Diagnosis and Treatment of Peptic Ulcer. L. D. Kiefer, Boston.—p. 187.
Perforation of Esophagus by Foreign Bodies: Report of Two Cases with Recoveries. G. O. Cummings, Portland.—p. 193.
Cervical Ribs. H. G. Hadley, Washington, D. C.—p. 197.

Medical Annals of District of Columbia, Washington**10:285-318 (Aug.) 1941**

- New Treatment and Public Health Concepts of Tuberculosis. F. W. Burge, Philadelphia.—p. 285.
 Riboflavin Therapy in Nonvascular Keratitis. B. Rones and E. McKay, Washington.—p. 290.
 Opera-Glass Hand (la Main en Lorgnette): Report of Case. D. C. Crain, Washington.—p. 293.
 Massive Retroperitoneal Leiomyosarcoma with Widespread Metastasis and Extension into Right Auricular Cavity. A. Trasoff and D. Meranze, Philadelphia.—p. 297.
 Fourth Annual Report of Diabetic Camp for Children. K. H. Mish and E. C. Rice, Washington.—p. 300.

Military Surgeon, Washington, D. C.**89:129-240 (Aug.) 1941. Partial Index**

- Malingering—A Study. A. G. Hulett.—p. 129.
 Scurvy, the Soldier's Calamity. V. E. Levine.—p. 140.
 Effect of Military Requirements on Civilian Aviation. D. R. Brimhall.—p. 155.
 Medical Military Training for Civilians: Medical Cadet Corps. C. B. Courville.—p. 161.
 Cyclopropane Anesthesia in Military Surgery. J. F. Kellogg, R. B. Phillips and S. L. Sabler.—p. 177.
 Emergency Measure and Foresight in Malaria Control. L. D. Fricks.—p. 182.
 Imbalanced Carbohydrate Metabolism as Predisposing Factor in Oral Diseases. E. K. Kelly.—p. 188.
 First Aid and Emergency Treatment of Gunshot Wounds of Jaws. R. H. Ivy.—p. 197.
 Management of Ocular Injuries. H. L. Bair.—p. 208.

Missouri State Medical Assn. Journal, St. Louis**38:267-302 (Aug.) 1941**

- Radiologic Management of Cancer of Cervix. E. C. Ernst, St. Louis.—p. 267.
 Cancer of Cervix Uteri: Biologic Factors in Treatment. A. N. Arneson, St. Louis.—p. 272.
 Breast Cancer: New Incision for Radical Operation. W. E. Leighton, St. Louis.—p. 274.
 Adamantinomas of Jaw. E. C. Padgett and N. B. Soderberg, Kansas City.—p. 276.
 Treatment of Lingual Cancer. L. H. Jorstad, St. Louis.—p. 279.
 Tumors of Brain: Case Report. R. M. Klemme and R. D. Woolsey, St. Louis.—p. 282.
 Missouri State Cancer Hospital No. 2: Group Clinic. F. G. Thompson and G. T. Bloomer, St. Joseph.—p. 284.
 Cancer Problem in Missouri. D. A. Robnett, Columbia.—p. 286.
 American Medicine Prepares. M. Fishbein, Chicago.—p. 287.

New England Journal of Medicine, Boston**225:171-206 (July 31) 1941**

- Fractional Bromsulphalein Test to Determine Liver Damage in Non-jaundiced Patients. E. Deutsch, Boston.—p. 171.
 Management of Blood Bank at Massachusetts Memorial Hospitals. F. E. Barton, Boston.—p. 176.
 *Evaluation of Peritoneoscopy, with Particular Reference to Diagnosis of Abdominal Tumors. W. E. Garrey, Boston.—p. 180.
 Myomectomy During Pregnancy. R. J. Heffernan, Brookline, Mass.—p. 185.
 Chemotherapy of Pneumonia, with Special Reference to Present Status of Sulfadiazine. M. Finland, Boston.—p. 187.

225:207-246 (Aug. 7) 1941

- Therapeutic Considerations of Thrombophlebitis and Phlebothrombosis. A. Ochsner and DeBaKey, New Orleans.—p. 207.
 Management of Gonorrhea: VI. The Sulfonamides. Neisserian Medical Society of Massachusetts.—p. 228.
 Artificial Feeding of Infants. R. C. Eley, Boston.—p. 230.

Peritoneoscopy.—Garrey believes that peritoneoscopy is not merely useful but also essential to the study of abdominal tumors and hepatic disease if needless laparotomies are to be avoided. Peritoneoscopy should never be used when there is a likelihood of bacterial infection in the free peritoneal cavity. In the 75 cases in which the author has employed it no mortality could be attributed to the procedure. Peritoneoscopy may confirm a diagnosis, render an exploratory laparotomy unnecessary and aid materially in giving a prognosis in (1) determining the presence, extent, nature and operability of cancer, (2) demonstrating the nature and extent of pelvic tumors and of lesions of the female pelvic organs, (3) making the differential diagnosis of ascites and (4) making the differential diagnosis of liver disease. In his cases there was no instance of an erroneous diagnosis. Biopsies were obtained from 15 patients. The gross

pathologic lesions were identified and a correct diagnosis was returned in 55. In 2 cases complicated by adhesions it was impossible to be certain of the diagnosis. The peritoneoscopic observations altered the treatment in 25 per cent of the patients.

New Jersey Medical Society Journal, Trenton**38:387-430 (Aug.) 1941**

- Résumé of Present Day Treatment of Arthritis. T. K. Lewis, Camden.—p. 391.
 *Regional Injection of Thiamine Chloride in Herpes Zoster. S. F. Smith, Highland Park.—p. 396.
 Draft Board Physician's Responsibility in National Defense. T. Robie, Montclair.—p. 398.
 Treatment of Blood Dyscrasias in Infancy and Childhood. W. B. Stewart, Atlantic City.—p. 401.
 Surgical Treatment of Complications of Peptic Ulcer. G. P. Muller, Philadelphia.—p. 404.
 Diagnosis of Annular Lesions of Skin. C. C. Carpenter, Summit.—p. 406.
 One Hundred and Fourteen Intranasal Ethmosphenoid Operations. W. W. Burritt, Summit.—p. 409.
 Physical Therapy in Peripheral Vascular Disease. B. S. Troedsson, Orange.—p. 411.

Thiamine Hydrochloride for Herpes Zoster.—Smith reports 3 instances of herpes zoster in which relief of symptoms was brought about by intracutaneous and subcutaneous injection of thiamine hydrochloride. Direct injection into the diseased dermatome has not apparently been employed heretofore. The thiamine hydrochloride was given only into the affected region. Therefore a purely local effect on nerve endings cannot explain the rapid improvement experienced by the patients. Lymphatic absorption may bring about a high concentration of thiamine hydrochloride in the affected region of the dorsal ganglions. Perhaps the effect is nonspecific, and other substances, e. g. choline derivatives of histamine, may achieve the result. Theoretically it is possible that the effect was mediated through changes in the physiology of nervous conduction.

New Orleans Medical and Surgical Journal**94:51-104 (Aug.) 1941**

- Importance of Venereal Disease Control in Louisiana. E. B. Vickery, New Orleans.—p. 51.
 Public Health Aspects of Pulmonary Tuberculosis. F. A. Musacchio, Crowley, La.—p. 54.
 Gallbladder Disease: Important Clinical Considerations. E. H. Gaither, Baltimore.—p. 61.
 Analysis of 220 Cases of Eclampsia from Charity Hospital of Louisiana at New Orleans. W. F. Guerriero, New Orleans; H. Leidenheimer Jr., Camp Shelby, Miss., and E. L. Zander, New Orleans.—p. 68.
 Nursery Diarrhea. S. H. Colvin and M. Emory, New Orleans.—p. 73.
 Reconsideration of Value of Nephropepy. H. J. Lindner and I. J. Glassberg, New Orleans.—p. 78.
 Finger Prints and Attempted Fraud. H. Cummins, New Orleans.—p. 82.
 Report from Medical Division of Selective Service of Louisiana. F. P. Rizzo, New Orleans.—p. 86.

New York State Journal of Medicine, New York**41:1507-1602 (Aug. 1) 1941**

- Recent Developments in Bacteriophage Therapy. W. J. MacNeal, New York.—p. 1531.
 Preparation of Desiccated Human Plasma by Mass Production Methods: Its Importance in Routine and Military Surgery. J. M. Hill, Dallas, Texas.—p. 1537.
 Deafness in Children: Early Detection, Management and Treatment. E. P. Fowler, New York.—p. 1543.
 Enormous Myelomeningocele with Fatal Leakage: Malformation at Foramen Magnum. A. D. Ecker and J. H. Ferguson, Syracuse.—p. 1549.
 Treatment of Menopause with Small Doses of Stilbestrol. S. Wimpfheimer and L. Portnoy, New York.—p. 1554.
 Physiologic Approach to Endocrine Treatment of Menstrual Disorders of Puberty. L. A. Siegel, Buffalo.—p. 1558.
 Mesenteric Cysts: Review of Literature; Genesis and Classification; Report of Case. M. J. Loeb, New York.—p. 1564.
 Early Diagnosis of Pulmonary Tuberculosis. W. L. Weintraub, Paterson, N. J.—p. 1570.
 Pulmonary Tuberculosis in Nurses. M. R. Louria, Brooklyn.—p. 1573.

North Carolina Medical Journal, Winston-Salem**2:369-468 (Aug.) 1941**

- Some Observations Drawn from Series of 500 Consecutive Thyroidectomies. R. B. McKnight, Charlotte.—p. 369.
 Breech Delivery. T. D. Tyson Jr., High Point.—p. 373.
 Sulfonamide-Drug Resistant Gonorrhea: Report of Case. J. Lyford Jr., Baltimore, and Mary A. Poston, Durham.—p. 375.
 Preoperative Disinfection of Skin in Major Surgery with 70 per Cent Alcohol by Weight. C. L. Haywood Jr., Elkin.—p. 377.

Ohio State Medical Journal, Columbus**37:609-724 (July) 1941**

- Recent Progress in Endocrinology. E. von Haam, Columbus.—p. 625.
Corpus Luteum Hormone and Testosterone in Treatment of Menorrhagia, Threatened Abortion and Dysmenorrhagia. D. T. Feiman, Canton.—p. 633.
Postoperative Urinary Retention: Its Treatment by Instillation of Mercurochrome. F. L. Johnson, Hamilton, Ont., Canada.—p. 635.
Evaluation of Continuous Spinal Anesthesia. J. D. Spaid, Dayton.—p. 637.
Industrial Eye Injuries. H. V. Phelan, Cleveland.—p. 641.
Endemic (Murine) Typhus Fever. G. W. Stober, Cleveland.—p. 644.
Deep Infections in Neck. S. Iglauder, Cincinnati.—p. 646.
Preparation of Slowly Absorbed Pollen Antigen: Preliminary Report. G. E. Rockwell, Cincinnati.—p. 651.
Electro Shock Therapy: Reportorial Review. J. L. Fetterman, Cleveland.—p. 653.
Syphilitic Aortitis with Occlusion of Right Coronary and Large Neck Vessels. H. S. Reichle, Cleveland.—p. 655.
Beginning of Medical Organization and Medical Practice at Warren, Ohio. J. J. Tyler, Warren.—p. 657.
Medical Sketches. L. S. Deitchman, Youngstown.—p. 660.

Oklahoma State Medical Assn. Jour., Oklahoma City**34:281-326 (July) 1941**

- Carcinoma of Cervix Uteri. A. N. Arneson, St. Louis.—p. 281.
Surgical Treatment of Radiation Damage to Tissue. G. H. Kimball, Oklahoma City.—p. 285.
Psychiatry in National Defense. L. H. Smith, Philadelphia.—p. 289.
Doctor's Relation to Public Health. J. A. Blue, Guymon.—p. 294.
Surgical Procedures for Relief of Intractable Pain. J. D. Herrmann, Oklahoma City.—p. 295.

34:327-372 (Aug.) 1941

- Surgical Procedures in Chronic Intestinal Obstruction. M. E. Stout, Oklahoma City.—p. 327.
Appendicitis in St. John's Hospital. E. O. Johnson, Tulsa.—p. 332.
Some Interrelationships of Maternal and Fetal Physiology. G. R. Osborn, Tulsa.—p. 342.
Modern Chemotherapy in Otorhinolaryngology and Ophthalmology. M. D. Henley, Tulsa.—p. 344.
Preoperative and Postoperative Management of Hyperthyroidism. C. E. Northcutt, Ponca City.—p. 351.

Pennsylvania Medical Journal, Harrisburg**44:1377-1504 (Aug.) 1941**

- Total Perineal Prostatectomy. G. G. Smith, Boston.—p. 1391.
Noise Drives Us Crazy: Causes of Echeoses. J. L. McCartney, New York.—p. 1402.
Problems in Practice of Pathology. H. I. Brown, Reading.—p. 1405.
Perforation in Cancer of Colon. W. L. Estes Jr., Bethlehem.—p. 1407.
Water and Electrolyte Relations in Body and Use and Abuse of Sodium Chloride in Pediatric Practice. T. S. Wilder, Philadelphia.—p. 1414.
Roentgen Ray Therapy for Benign Otorhinologic Conditions. M. S. Ersner, Philadelphia.—p. 1418.
Control of Gonadal Development. L. G. Rowntree and N. H. Einhorn, Philadelphia.—p. 1423.
Aplastic Leukemia. H. R. Fisher, Philadelphia.—p. 1432.
Pediatric Approach in Prevention of Behavior Problems. J. J. Waygood, Philadelphia.—p. 1440.
Thrombocytopenic Purpura. T. C. Kelly, Philadelphia.—p. 1442.
Familial Eosinophilia. J. E. Bowman, Philadelphia.—p. 1445.
Subcutaneous Urography. E. A. Mullen, Philadelphia.—p. 1447.
Survey of Five Fatal Cases of Influenzal Meningitis. C. R. Barr, Philadelphia.—p. 1449.
Prevention of Diabetes. J. D. Paul, Philadelphia.—p. 1451.

Total Perineal Prostatectomy.—Smith analyzes results of a total perineal prostatectomy for malignant neoplasm in 71 patients. He does not believe that the operation should not be attempted if the growth is not confined to the prostate or involves the outer portions of the vesicles. The rectum should be movable over the prostate. The upper border of the gland should be clearly defined and the base of the bladder about it should not be indurated. There should be a sulcus between the prostate and the pelvic walls laterally and a clearly defined space between the apex of the gland and the perineum. The gland should not be too fixed in the pelvis, although some prostates thought to be fixed have actually been free from neoplastic adhesions. The base of the bladder and trigon should show no nodules of tumor, but lesions in the prostatic urethra are not contraindications to total prostatectomy. No one past 75 years

of age should be subjected to this operation. Metastases in the pelvic or sacral region may give the decision against the radical operation. Of the 71 patients, 5 died in the hospital, 35 died of recurrence of the cancer, 7 died of other causes, 4 are alive but their cancers have recurred and 19 are living apparently without recurrence for from one to twelve years. Twenty-one patients have lived five or more years; their average postoperative life was eight years. Of the 35 who died of recurrence 9 lived for more than five years; most of them were in good health until a few months before death. Paraplegia developed in 7 of these 35 patients. It would be interesting to know whether the spinal lesion was secondary to a local recurrence, or whether the metastasis antedated the prostatectomy. Of the four patients living with a recurrence, urinary obstruction was developed in 2. Seven of 62 patients (also excluding the 5 who died in the hospital) had poor urinary control, 11 had fair control, 24 had "good" control and 20 had normal control.

Philippine Medical Association Journal, Manila**21:229-278 (May) 1941**

- Lanes and By-Lanes of Our Medical Problems. M. Cañizares, Manila.—p. 229.
Health and Public Welfare. J. Fabella, Manila.—p. 237.
Health and Hospital Service in the Philippines. S. Y. Orosa, Batangas, Batangas.—p. 243.

21:279-330 (June) 1941

- Plan for Military Medical Preparedness. J. A. Sanchez.—p. 279.
Schistosomiasis Involving Brain: Two Case Reports. W. Vitug, J. R. Cruz and L. D. Bautista, Manila.—p. 291.
Recent Advances in Nutrition: I. Newer Diagnostic Methods. S. G. Jao, Manila.—p. 299.

Psychiatric Quarterly, Utica, N. Y.**15:203-404 (April) 1941**

- Metrazol as Adjunct to Treatment of Mental Disorders. C. O. Cheney, D. M. Hamilton and W. L. Heaver, White Plains, N. Y.—p. 205.
Leber's Primary Optic Atrophy with Other Central Nervous System Involvement. S. Androp, Catonsville, Md.—p. 215.
Alcohol Susceptibility Skin Test. D. M. Kelley and S. E. Barrera, New York.—p. 224.
Blushing. S. Feldman, New York.—p. 249.
Study of a Group of Recovered Schizophrenic Patients. O. Kant, Worcester, Mass.—p. 262.
Psychoses Associated with Essential Hypertension. M. D. Riemer, Brooklyn.—p. 284.
Behavior Characteristics of Schizophrenic Children. C. Bradley and Margaret Bowen, East Providence, R. I.—p. 296.
Erroneous Recognition (Fausse Reconnaissance). C. P. Oberndorf, New York.—p. 316.
Force Concept in Catatonia. G. S. Sprague, White Plains, N. Y.—p. 327.
Study of Serum Proteins in Mental Disease. A. A. Kondritzer and S. E. Barrera, New York.—p. 336.
Sequelae in Post-Traumatic Psychoses: Study of Sixty-Seven Cases with Encephalograms in Ten. H. L. Vyner and H. Swire, Brentwood, N. Y.—p. 343.
Curarization with Quinine Methochloride to Prevent Traumatic Complications of Metrazol Shock Therapy. A. E. Bennett and P. T. Cash, Lincoln, Neb.—p. 351.
Plea for Standardization of Records of Pharmacologic Shock Treatment of Psychoses in New York State Hospitals. W. B. Cline Jr., Wingdale, N. Y.—p. 357.
Treatment of Agitated and Depressed Mental States with Benzedrine Sulfate and Sodium Amytal. R. A. Chittick and A. Myerson, Waverley, Mass.—p. 362.
Sedative Action of "Delvalin" Sodium in Disturbed Psychiatric Patients: Preliminary Report. E. Davidoff, Syracuse, N. Y.—p. 370.
Note on Occurrence of Ruptured Duodenal Ulcer in Two Patients Previously Treated with Metrazol. C. D. Moore and S. Friedman, Newton, Conn.—p. 380.

Psychoanalytic Quarterly, Albany, N. Y.**10:365-512 (July) 1941**

- Important Factor in Eating Disturbances of Childhood. Editha Sterba, Detroit.—p. 365.
Role of Detective Stories in Child Analysis. Edith Buxbaum, New York.—p. 373.
Possible Occurrence of Dream in 8 Month Old Infant. M. H. Erickson, Eloise, Mich.—p. 382.
A Child Talks About Pictures: Observations About Integration of Fantasy in Process of Thinking. M. Grotjahn, Chicago.—p. 385.
Child Analysis. Agnes B. Greig, Washington, D. C.—p. 395.
Influence of Psychoanalysis in Education. Caroline B. Zachry, New York.—p. 431.
The School and Child Guidance. Editha Sterba, Detroit.—p. 445.

Public Health Reports, Washington, D. C.

56:1191-1232 (June 6) 1941

Methods for Controlling *Aedes Aegypti* Mosquitoes with *Gambusia Holbrooki* Minnows at Key West, Fla. J. H. Le Van.—p. 1217.

56:1233-1268 (June 13) 1941

Cirrhosis of Liver in Rats on Deficient Diet and Effect of Alcohol. R. D. Lillie, F. S. Daft and W. H. Sebrell Jr.—p. 1255.

56:1269-1300 (June 20) 1941

Radio Pratique at Port of New York. R. Olesen.—p. 1269.
Growth and Effects of Tubercle Bacillus on Chorioallantoic Membrane of Chick Embryo: Method for Studies in Chemotherapy. E. W. Emmart and M. I. Smith.—p. 1277.

56:1301-1350 (June 27) 1941

Medical Evaluation of Nutritional Status: IV. Ocular Manifestations of Avitaminosis A, with Special Consideration of Detection of Early Changes by Biomicroscopy. H. D. Kruse.—p. 1301.
Regional, Racial and Familial Relationships in Leprosy in the United States. W. L. Aycock and J. W. Hawkins.—p. 1324.
Sporozoites of *Plasmodium Lophurae*, Avian Malaria Parasite, in *Anopheles Quadrimaculatus*. H. S. Hurlbut and R. Hewitt.—p. 1336.

56:1351-1410 (July 4) 1941

A National Emergency Exists. W. P. Shepard.—p. 1351.
Lead and Arsenic Ingestion and Excretion in Man. S. H. Webster.—p. 1359.
Dental Status and Dental Needs of Young Adult Males, Rejectable, or Acceptable for Military Service, According to Selective Service Dental Requirements. H. Klein.—p. 1369.
Protective Antibodies Against St. Louis Encephalitis Virus in Serum of Horses and Man. C. B. Philip, H. R. Cox and J. H. Fountain.—p. 1388.
Susceptibility of Horses to St. Louis Encephalitis Virus. H. R. Cox, C. B. Philip and J. W. Kilpatrick.—p. 1391.

56:1411-1452 (July 11) 1941

Hospital Masks: Their Bacterial Filtering Efficiency and Resistance to Air Flow: Comparative Study. R. Rooks, L. J. Cralley and M. E. Barnes.—p. 1411.
Public Accidents Among Urban Population as Recorded in National Health Survey. Joan Klebba and R. H. Britten.—p. 1419.
Oral Transmission of *Plasmodium Relictum* in Pigeon. M. D. Young.—p. 1439.

56:1453-1494 (July 18) 1941

Program for Civilian Mental Health. W. B. Miller.—p. 1453.
Studies in Childbirth Mortality: III. Puerperal Fatality in Relation to Mother's Previous Infant Losses. J. Yerushalmy, Elizabeth M. Gardiner and C. E. Palmer.—p. 1463.

56:1495-1534 (July 25) 1941

Study of Relationship of Oral *Lactobacillus Acidophilus* and Saliva Chemistry to Dental Caries. F. A. Arnold Jr. and F. J. McClure.—p. 1495.

56:1535-1580 (Aug. 1) 1941

*Pertussis Prophylaxis with Two Doses of Alum Precipitated Vaccine. J. A. Bell.—p. 1535.
*Susceptibility of Young Mice (*Mus Musculus*) to *Leptospira Icterohemorrhagiae*. C. L. Larson.—p. 1546.
Statistics of Poliomyelitis in the Territory of Hawaii. R. K. C. Lee.—p. 1556.

Pertussis Prophylaxis.—Bell finds that two 1 cc. doses of alum precipitated pertussis vaccine given to children at intervals of four weeks protects them against the disease. His study extended from June 1938 to April 1941. Of 493 vaccinated children who on June 1, 1938 were not more than 11 months of age only 51 by April 1, 1941 had contracted the disease. This gives a percentage of 10.3. In support of the protection conferred by the vaccine it is seen that of 432 similar children not vaccinated 150, or 34.41 per cent, contracted the disease during the thirty-four months of observation. Of the vaccinated children 13, or 2.64 per cent, whooped and had paroxysmal coughing for more than twenty-seven days, as compared to 69, or 15.97 per cent, of the children who were not so treated. The author states that only the influence of the alum precipitated pertussis vaccine could account for the disproportionate results in the two groups of children. He can conceive of no other factor that could consistently influence the result and be equally operative in each geographic section of the city, in the white as well as in the Negro children, in males as well as in females and in the younger as well as in the older children.

Susceptibility of Young Mice to *Leptospira*.—Larson reports experimental studies which show that young white mice (*Mus musculus*) are uniformly susceptible to frank infection with *Leptospira icterohemorrhagiae*. Signs of generalized infec-

tion develop in them prior to death. The mortality rate approximates 100 per cent in mice 3 weeks old but decreases rapidly as their age increases. Infection may be induced by intraperitoneal, subcutaneous or oral routes. The author states that three strains of *L. icterohemorrhagiae* originally isolated from wild rats were maintained in mice in a fully virulent state for twenty-seven, twenty-five and six passages.

Review of Gastroenterology, New York

8:267-342 (July-Aug.) 1941. Partial Index

Right Side Gastroscopic Technic in Situs Inversus Viscerum and in Visualization of "Blind Spots." L. H. Berry, Chicago.—p. 267.
Mode of Action of Bran: II. Influence of Size and Shape of Bran Particles and of Crude Fiber Isolated from Bran: Preliminary Report. B. Fantus, Neil Hirschberg and W. Frankl, Chicago.—p. 277.
Critical Analysis of Series of Appendectomized Patients. Z. Sagal and W. Heinemann, New York.—p. 286.
Clinical Classification for Paraesophageal Hernia: M. W. Shulkin, Milwaukee.—p. 308.
Prophylaxis in Diseases of Rectum. R. J. Connors, New York.—p. 312.
Dietetic Problems of Cancer Patient. C. J. Drucek, Chicago.—p. 317.
Hepatic and Cutaneous Complications of Gold Therapy, with Special Reference to Their Pathogeny. M. Vauthey, Vichy, France.—p. 326.

Rhode Island Medical Journal, Providence

24:145-160 (Aug.) 1941

Sex Hormones: Clinical Application. W. O. Thompson and N. J. Heckel, Chicago.—p. 145.
Newport Sojourn of Bishop Berkeley. J. E. Donley, Providence.—p. 149.
Communication on Selective Service. I. C. Nichols, Providence, and H. W. Williams, Howard.—p. 152.

Rocky Mountain Medical Journal, Denver

38:593-680 (Aug.) 1941

Obscure Fever. J. G. Carr, Chicago.—p. 610.
*Acrodynia. R. J. Groom, Grand Junction, Colo.—p. 616.
Thrombosis of Veins and Arteries of Lower Extremity. A. W. Metcalf, Denver.—p. 620.
Varicose Vein Treatment. E. J. Perkins, Denver.—p. 623.
Trophic Ulcer Complicating Operative Procedures for Relief of Trigeminal Neuralgia. O. S. Philpott, Denver.—p. 626.
Classification and Prognosis of Congenital Defects. H. E. Coe, Seattle.—p. 630.

Acrodynia.—Groom states that the etiology of acrodynia is not agreed on. The theories advanced are infections of the upper part of the respiratory tract, vitamin deficiencies, an unidentified virus and arsenical toxicosis. The disease shows no racial incidence; it has been reported from Australia, France, Germany and the United States. There is no seasonal immunity; the majority of cases have their onset between January and June. It is sporadic, not epidemic, and is more frequent in rural than in metropolitan areas. The pathologic changes are chiefly in the sensory, motor and vegetative nervous systems. Acrodynia occurs in infants as young as 2 months and in children up to 6 years of age; the average age ranges between 1 and 3 years. Symptoms in well developed acute cases are changes in personality, poor appetite, swollen pink or bluish hands and feet and a diffuse erythematous rash on the trunk and the extremities. The hands and feet itch and burn, perspiration becomes marked in various locations, generally a photophobia and a definite hypotonia are present, and, with other trophic lesions, corneal ulcers may occur or ulcerations of mucous membranes of the tongue or buccal surfaces. An elevated blood pressure, with a proportionate elevation in the pulse, is a constant observation. The child's sleep habits are disturbed; the insomnia may resemble an encephalitis or the child may sleep through the day to remain awake at night, although his sleep is restless and superficial. There is no line of demarcation in the pink color of the hands and feet, as in pellagra. In severe cases the nails, hair and teeth may fall out—as the result of trophic disturbances. There is no specific treatment for the condition. Palliative measures relieve the cutaneous itching and burning. Infra-red and ultraviolet irradiation have been used by some with success. Owing to the child's lowered resistance, susceptibility to cross infection is high and therefore home treatment is preferable. The death rate for patients treated at home in Australia is 3 per cent as compared to 30 per cent among hospitalized patients. The author reports 3 cases encountered within one year.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

53:201-230 (July) 1941

Pigmentation and Transplantation. A. Fessler.—p. 201.

Naevus Sebaceous and Sebaceous Carcinoma. L. Savatard.—p. 214.

British Journal of Surgery, Bristol

28:517-660 (April) 1941

Nasopharyngeal Carcinoma. K. H. Digby, W. L. Fook and Y. T. Che.—p. 517.

Intradural Epidermoid Cyst of Spinal Cord: Report of Case with Remarks on Early Diagnosis. M. A. Falconer and R. S. Hooper.—p. 538.

Liver "Sequestrum" Complicating Subcutaneous Rupture of Liver: Case. R. Clarke.—p. 544.

Dumb-Bell Tumors of Spine. K. Eden.—p. 549.

Primary Chondroma of Bronchus: Case. M. Davidson.—p. 571.

"Simple" Ulcers of Cecum, Colon and Rectum. D. Barlow.—p. 575.

Arteriovenous Aneurysm: Case. S. M. Cohen and C. A. R. Schulenburg.—p. 582.

Experiences in Reparative Surgery of Upper Limb. P. P. Cole.—p. 585.

Dumb-Bell Ganglioneuroma of Chest. D. Paterson and R. S. Pilcher.—p. 608.

Traumatic Expulsion of Astragalus. H. J. McCurich.—p. 611.

Current Practice in Anesthesia and Analgesia. C. L. Hower.—p. 615.

British Medical Journal, London

2:39-74 (July 12) 1941

Problems of Circulation. R. J. S. McDowall.—p. 39.

*Local Treatment of Burns. R. S. B. Pearson, E. E. Lewis and R. B. Niven.—p. 41.

*Treatment of Burns by Envelop Irrigation. J. W. Hannay.—p. 46.

Mumps Meningoencephalitis. A. W. Frankland.—p. 48.

Treatment of Impotence: Coitus-Training Apparatus. J. Loewenstein.—p. 49.

Local Treatment of Burns.—Pearson and his associates compare the value of the irrigation envelop method of Bunyan and the local use of sulfanilamide powder and tulle gras as recommended by Matthews. After treating 13 cases of superficial burns, 3 deep burns and 3 secondary burns by one or the other method they find that the two new methods possess advantages over older procedures. For superficial burns sulfanilamide and tulle gras has been especially successful, and rapid healing, with good function, has resulted. Bunyan's envelop method is useful for more extensive burns and for deep burns in which necrotic tissue must separate before grafting is possible. In some cases a change from one method to the other has been successful. Both methods possess an advantage over tanning treatment: infection can always be limited and never develops to the same extent as often happens under tanned areas, and the splinting effect of tans, with their possible immobilization of joints, is avoided. In widespread burns of the trunk, tanning methods may still be life saving in the early stages. Treatment with the irrigation method is relatively painless, but that with sulfanilamide and tulle gras has been almost entirely painless.

Treatment of Burns by Envelop Irrigation.—Hannay presents results obtained in 16 burned patients treated by Bunyan's envelop irrigation method and in 8 patients treated by other methods. He believes that when thorough surgical technic is impossible the envelop method will minimize the dangers of infection and that if infection is already present no other method will clean the wound so rapidly and effectively. The treatment is almost painless. The author stresses that the great value of the envelop irrigation method is the almost definite certainty that nothing more than mild infection is likely to occur. This cannot be claimed for any other procedure.

Glasgow Medical Journal

18:1-32 (July) 1941

Persistence of Chronic Peptic Ulcer. J. P. Fleming.—p. 1.

Journal of Laryngology and Otology, London

56:119-150 (April) 1941

Adenoids, with Reference to Methods of Removal. V. E. Negus.—p. 119.

Annales Pædiatrici, Basel

156:257-372 (No. 5/6) 1941

*Cystine Diathesis. A. Hottinger.—p. 257.

*Anatomic Aspects of Cystine Diathesis with Dwarfism. F. Roulet.—p. 284.

Ophthalmic Changes in Cystine Disease. E. Bürki.—p. 324.

Bone Analysis in a Case of Cystine Diathesis. E. Freudenberg.—p. 335.

*Diagnosis of Cystine Disease. Margrit Esser.—p. 344.

Indications for Ear Operations During Infancy. H. Flesch.—p. 348.

Determination of Thyroid Hormone in Connection with Infectious Diseases. S. Zimányi.—p. 357.

Aspects of Cholascos During Childhood. E. Melchior.—p. 364.

Cystine Diathesis.—Hottinger describes the cystine diathesis on the basis of a case diagnosed during life as dwarfism with renal hyperphosphatemic rickets. Symptoms of storage disease were evident in the course of the disorder. The tentative clinical diagnosis of cystine diathesis was corroborated post mortem. The disease is hereditary. During infancy anorexia, thirst, nephritis, preuremic conditions, arrest of growth, rickets and hypophosphatemia are observed. In later childhood there are anorexia, nephritis, inhibition of growth, rickets and osteodystrophy in the presence of hyperphosphatemia. Milder cases exhibit renal concretions with more or less extensive destruction of the kidneys. This mild form is observed mostly in adults. Cystinuria is likewise more common in adults than in children. A disturbance in the splitting up of a metabolic precursor of cystine is regarded as the pathogenic factor of the disease. The consequences of such disturbance are deposits of cystine crystals in the reticuloendothelium, arrest of growth and renal disturbances. The author thinks that "renal rickets with glycosuric dwarfism" and "incurable rickets with glycosuria" reported in literature are in reality cases of cystine diathesis. No treatment exists for cystine diathesis.

Anatomic Aspects of Cystine Diathesis.—Roulet reports postmortem studies in Hottinger's case. He stresses that deposits of crystalline cystine were found throughout the reticuloendothelial system. Cystine was present as hexagonal crystals (diameter up to 10 microns) and smaller prisms. The crystals were enclosed in the sinuses of the lymph nodes and in the pulp of the spleen. The crystals probably enter the cells by phagocytosis caused by the elements of the reticuloendothelial system of the spleen, liver and lymph nodes. The spleen is enlarged in most of the cases and has a multicolored spotted appearance with yellow-whitish stripes, corresponding to the deposits of cystine. The liver is enlarged. Small yellow-white, triangular spots can be recognized in it. In the case under discussion much glycogen was found. Cells filled with cystine are large and mulberry-like, up to 40 microns. Cystine can be easily overlooked because of its solubility in acids, alkalis and solution of formaldehyde. Only alcohol should be used as a fixative. The renal changes are of a nephrotic type or are like those of renal dwarfism; they present a picture of interstitial nephritis with atrophy. In the author's case there were a chronic interstitial inflammation and subacute glomerular nephritis. The bones exhibited signs of rickets combined with symptoms of fibrous osteodystrophy, lacunar absorption and deformation of the trabeculae. These bone changes are not specific for cystine diathesis; they develop also in the presence of renal osteodystrophies. The relative increase in the weight of the heart is probably related to the increased blood pressure of patients with glomerular nephritis. The liver is generally relatively enlarged. This is probably only partly the result of cystine storage. It is possible that storage of glycogen plays a part.

Diagnosis of Cystine Disease.—Esser points out that diagnosis of cystine disease in children is difficult because cystine sediment in the urine may be constantly absent in children. Sternal puncture is helpful, because crystals of cystine can be found in the reticulum cells of the bone marrow. Smears of bone marrow and of blood contained 15.8 and 9 per cent, respectively, of eosinophils. There were no other reasons for this augmentation than the cystine disease. It is noteworthy that there was no increase of reticulum cells in the bone marrow. This is in distinct contrast to the behavior of the bone marrow in lipoidosis.

Policlinico, Rome**47:1787-1834 (Oct. 28) 1940. Prac. Sec. Partial Index**

*Sternal Puncture in Differential Diagnosis of Malarial Splenomegaly. L. Armentano and A. Bentsath.—p. 1787.

Malarial Splenomegaly.—Armentano and Bentsath direct attention to the value of sternal puncture in the diagnosis of malarial splenomegaly. They report two cases of acute splenomegaly with subacute anemia in which repeated examination of the blood, even after administration of epinephrine, failed to show malarial plasmodia. Pigmented and nonpigmented forms of malarial plasmodia were identified in the blood of the bone marrow which was obtained by sternal puncture. Malaria, anemia and splenomegaly were rapidly controlled by antimalarial therapy.

Rivista di Patologia Nervosa e Mentale, Florence**56:185-350 (Sept.-Oct.) 1940. Partial Index**

*Uveoparotid Fever: Neurologic Symptoms. P. Ottonello and T. Anardi.—p. 185.

Neurologic Symptoms of Uveoparotid Fever.—Ottonello and Anardi report that a woman aged 58, without any prodromal symptoms, exhibited a total paralysis of the left facial nerve. This was followed in two days by a transient slight bilateral swelling of the parotid glands. Total paralysis of the right facial nerve and disturbance of deglutition and of the vocal cords appeared one week later. Inflammation of the parotid became manifest one month later. Anisocoria and pupillary rigidity appeared in forty-five days and an acute polyneuritis of all four extremities in seventy-five days. The deep reflexes disappeared in the course of the disease, and signs of involvement of the cardiac vagus became evident. The lymph nodes were not enlarged with the exception of the hilar nodes, which were moderately enlarged. All the symptoms with the exception of the left facial paralysis disappeared within five months. The tuberculin skin test and the examination of the sputum for tubercle bacilli were negative. The cerebrospinal fluid exhibited changes of a meningeal character, a slight lymphocytosis and a slight increase in the globulins. The diagnosis of uveoparotid fever was verified by a biopsy. The authors conclude that paralysis of the facial nerves and neurologic complications of the uveoparotid fever are caused by selective localization of the unknown virus of the disease in the nerves.

Anais Brasileiros de Ginecologia, Rio de Janeiro**11:503-572 (June) 1941. Partial Index**

*Sterility from Intrauterine Injections of Caustic Substances. C. Salgado.—p. 503.

Sterility from Injections of Caustic Substances.—Salgado directs attention to the use of intrauterine injections of caustic substances as an anticonception method in some countries. A mixture of iodine and phenol is generally used during the postmenstrual period. It prevents the pre-pregnancy proliferation of endometrium and conception and also causes early expulsion of the egg. It injures the uterine mucosa and causes scars, permanent atrophy of the endometrium and permanent tubal obstruction, which was identified by hysterosalpingography in 3 cases.

Arch. Lat. Amer. de Card. y Hemat., Mexico**11:39-90 (March-April) 1941. Partial Index***Cardiohepatic Paradoxal Mobility. T. Ortiz and Ramirez.—p. 39.
Technic for Study of Nucleoli of Blood Cells. I. Gonzalez Guzman.—p. 63.

Cardiohepatic Mobility.—Ortiz and Ramirez found on palpation and percussion of the cardiac and hepatic areas in patients with cardiac insufficiency and enlargement of the liver that both structures present an upward displacement when patients change from the recumbent to the semisitting posture and a downward displacement when they are placed on their

backs. These changes, paradoxical so far as laws of gravity are concerned, are frequently present in moderate and acute hepatomegaly of any origin provided the intra-abdominal hypertension is present and the walls of the abdomen are tense and resistant. In such conditions intra-abdominal tension increases when the patient changes from the recumbent to the semisitting position and upward displacement takes place. This is evident on palpation and percussion of the cardiac and liver areas, so that a roentgen examination is unnecessary. The upward displacement of the liver may reach 4 cm. in width, simulating diminution in the size of the liver. It is advisable therefore to compare the degree of displacement of these structures by repeated examinations with the patient in the same position and asking him to breathe naturally and evenly during the examination in order to prevent excessive excursions of the diaphragm which will result in limiting the upward displacement of the organ. Upward displacement of the heart has no significance. That of the liver is of importance in differentiating it from actual diminution in the size of the liver. Intra-abdominal hypertension may occur in pleurisy when the examination is performed with the patient sitting up in bed with the thorax bent forward. It will result in the production of upward displacement of the diaphragm and will prevent the perception of dullness in the pleural area.

Medicina, Mexico**21:265-312 (July 10) 1941. Partial Index**

*New Method of Concentration of Tubercle Bacilli. J. de J. Curiel.—p. 303.

Concentration of Tubercle Bacilli.—Curiel places the sputum into a graduated centrifuge tube, adds acetic acid in proportion to the amount of mucin present and closes the tube with a rubber stopper. The tube is shaken until the mucin has been liquefied and the fluid is homogeneous and does not show solid particles. Ten cc. of physiologic solution of sodium chloride is added and the tube shaken again for several minutes. Sufficient solution of sodium hydroxide to neutralize the acid is added, and the mixture is shaken once more. The mixture is then centrifugated for fifteen minutes. This effects a separation into three layers. The top layer consists of a fine foam, the second of liquids and the third, at the bottom of the centrifuge tube, of epithelial cells, leukocytes, elastic fibers and mycelia of fungi. Micro-organisms and elements of small size are deposited on the border of the second and third layers. After the liquid has been decanted the aforementioned elements form a sediment. Material is taken with a platinum loop from the surface of the sediment. The smear is stained according to Ziehl-Neelsen and Gram.

Deutsche medizinische Wochenschrift, Leipzig**67:455-478 (April 25) 1941. Partial Index**

Experiences in Internistic Consultation. M. Gänsslen.—p. 455.

*Prognosis of Multiple Sclerosis. K. Beringer.—p. 461.
When Do Palatine Tonsils Require Surgical Treatment? A. Lautenschlager.—p. 463.

Importance of Animal Experiment for Diagnosis and Treatment of Virus Diseases. E. Haagen.—p. 465.

Prognosis of Multiple Sclerosis.—Beringer evaluates various factors of influence in the prognostic evaluation of multiple sclerosis and finds that, if the disease begins with a short siege and is followed by a good remission, the remission may be a prolonged one. Prolonged remissions seem to be especially likely if the disease has its onset at a comparatively early age with ophthalmic symptoms. The more rapidly the sieges follow each other, the more doubtful is the prognosis. Stationary forms may show surprising and considerable abatements, but generally they show a tendency to slow progression. In view of the incalculable course it is impossible to estimate the therapeutic methods. The therapeutic optimist may ascribe to a treatment what the therapeutic skeptic ascribes to a spontaneous remission. However, it is generally agreed that rest

is helpful and necessary at the onset of an attack. The incalculability of the course of multiple sclerosis makes prognostic evaluation extremely difficult in the individual case. Extensive statistics reveal that multiple sclerosis generally has a serious prognosis.

Klinische Wochenschrift, Berlin

20:377-408 (April 19) 1941. Partial Index

Cardiac Efficiency During Physical Effort in Health and Disease. H. C. Landen and H. Alleröder.—p. 384.

*Pseudo-Banti's Syndrome in Presence of Acquired Syphilis: Case. H. Curschman.—p. 386.

New Definition of Cardiac Weakness. F. Meyer.—p. 390.

*Adrenal Cortex Tumors and Hypertension. L. Hantschmann.—p. 394.

*Cytologic Tumor Diagnosis from Tissue Obtained by Puncture. W. Tischendorf.—p. 398.

Pseudo-Banti's Disease with Syphilitic Background.—Curschman reports a typical syphilitic pseudo-Banti's syndrome in an unmarried woman aged 42 which came under his observation at a time when hepatic cirrhosis, ascites and esophageal varices were seen. The true pathologic condition was discovered only through positive Wassermann reactions. Appropriate treatment led to an uneventful recovery. He finds that this syndrome is neither sufficiently treated in the textbooks nor often correctly diagnosed in practice and results in numerous unnecessary splenectomies. In the case material of one investigator totaling 123 cases, which included 65 splenectomies and 58 spleen tumors obtained by section, only 1 true case of Banti's disease occurred. No diagnosis of true Banti's disease should be accepted until the possibility of syphilitic involvement has been excluded.

Adrenal Cortex Tumors and Hypertension.—Hantschmann attributes chronic red hypertension, encountered in 5 cases, 4 of which could be examined at necropsy or biopsy, to the presence of tumors of the adrenal cortex. The clinical signs of hirsutism, of facial rubor and reduced carbohydrate tolerance, associated with a correspondingly high blood pressure, were significantly manifest in 3 women aged 24, 28 and 38. The 2 highly hypertensive male patients (61 and 50 years), besides unilateral hypernephroma in the first and a cortical adenoma with fatty degeneration in the second, disclosed cardiac involvements. The author believes that hypertension, in the presence of a tumor of the adrenal cortex, may be due to a hormone secreted by this cortex. This secretion is not identical with epinephrine, though interrelated modifications may exist. This hormone narrows the arterioles without contracting the capillaries. The assumption of a cortical hormone provides an explanation for sudden circulatory collapse due to shock after tumor extirpation, observed also in 1 of the 5 cases. The fact that available adrenal cortex extract is capable only of normalizing the blood pressure without provoking hypertension may merely indicate insufficient cortical concentration in the extract. Though patients with adrenal cortex tumors and those with anterior lobe adenomas present similar symptoms, no hypophysial action is involved since pathologic anatomic examinations have repeatedly (as also in the 2 male cases) demonstrated a normal hypophysis. In view of the increasing number of cases reported in the literature, the problem of the interrelation between adrenal cortex tumors and hypertension merits greater attention. The actual discovery of this assumed secretion may accomplish more, the author believes, than to clarify the problem in hand.

Cytologic Tumor Diagnosis by Puncture.—According to Tischendorf, puncture followed by examination of suspected organic tissue is often the only means of diagnostic certainty. In the majority of cases, tumor cells present cytologic characteristics which enable ready identification. Tumor cells usually appear in smear preparations as nestlike agglomerations; they may, however, pervade the puncture tissue almost exclusively. But even when endothelial cells, derived from serous membranes in ascites or pleural effusion, are intermingled, tumor cells can be identified. Carcinomatous cells are generally distinguishable from sarcomatous cells. The former are generally larger and exhibit a high degree of polymorphism. Individual cells may vary in size; exceptionally large tumor cells as well as giant

cells are not infrequently encountered. The cell nuclei contain exceptionally large nucleoli which give a luminous blue stain with the May-Grünwald-Giemsa method. Mitosis and amitosis are also seen. The large nuclei of carcinomatous cells are generally matched by equally wide plasmatic margins. Sarcomatous tumor cells are smaller than carcinomatous cells, more uniform and with remarkably fusiform nuclei, except in small cell and lymphosarcomatous tumors. Evidence of nuclear segmentation is not so frequently encountered; if nucleoli are present at all, they are of minute proportions. Polymorphocellulosity is not often encountered. Besides group characteristics, tumor cells in smear preparations disclose individual traits, which have differential diagnostic value. For example, cells found in tumors involving stratified epithelium are characterized by size and polymorphism. Their plasma and nuclei show a strong staining susceptibility. In mammary carcinoma it is the plasma which predominantly shows polymorphism. The cell nuclei are uniformly small and show pyknosis. In some cases the plasma attains the dimensions of small lymphocytes. Other mammary tumor cells display increasing vacuolation. These vacuolating tumor cells are productive of mucus and other secretions and almost typical for adenomatous mammary carcinoma. The author points out that, though not all tumor cells are cytologically classifiable with finality, their tumoral character cannot be doubted. Tissue puncture involves no risk, even when performed on the liver, if carefully done in accordance with clinical and roentgenologic findings. However, the evaluation of tumor tissue obtained by puncture requires experience and is not without difficulties both in the smear preparations and in the segments made for microscopic examinations.

Münchener medizinische Wochenschrift, Munich

88:353-380 (March 28) 1941

*New Apparatus for Detecting Metallic Foreign Body in Human Organism. H. Oberdalloff.—p. 353.

Abduction Plaster Cast or Abduction Splint. N. Grzimek.—p. 354.

Surgical Treatment of Patients with Coronary Infarct. G. Landes and H. Mohr.—p. 355.

Pain in Angina Pectoris. F. Lange.—p. 359.

*Dangers Involved in Treatment with Depot Insulin and Suggestions to Counteract Them. C. Dienst.—p. 364.

Method for Computation of Manifest and Latent Cases of Diabetes Mellitus in a Population. Greiff.—p. 366.

Causal Prophylactic Therapy of Beginning Pregnancy Toxicoses and of Other Disorders of Pregnancy. A. Hessler.—p. 369.

Improved "Siesta" Glasses an Optic Aid for Reading While Reclining. H. Schäfer.—p. 371.

New Apparatus for Detecting Metallic Foreign Body in Human Organism.—Oberdalloff directs attention to two new instruments for the detection of metallic foreign bodies. The first one is the "boloscope," which was developed in the Netherlands. Two pencils of roentgen rays are so focused that the foreign body is at their point of intersection. The pencils of rays from two direction lamps which are coupled with the roentgen rays likewise converge on the foreign body and thus lead the surgeon to the foreign body under ordinary light. The other new apparatus for the detection of foreign bodies utilizes the change of the inductivity in the oscillation circuit of a high frequency transmitter when approaching metal bodies. This so-called metal searcher was used by the author on 65 patients for the removal of 75 metallic foreign bodies of various sizes and shapes from different parts of the body. In some instances the missile had been suspected in a different location than the one indicated by the tone of the search probe, but the tone was always correct. The directing tone is so loud that a person in an adjoining room can judge that "now the surgeon has reached the foreign body." It is of course necessary that metallic instruments be kept away from the wound for at least 10 cm. while the search is being made. The retractors should be of nonmetallic substances (such as plexiglass).

Hazards with Depot Insulin.—Dienst emphasizes that acidosis is the danger point in every case of diabetes mellitus. It had been banished by the administration of adequate doses of ordinary insulin, but since the introduction of depot insulin it has again assumed importance. It may become manifest as a residual acidosis if the patient is intentionally adjusted to a

residual glycosuria by giving less than the required dose of depot insulin and a diet that does not have an excess of alkalis. This residual glycosuria is accompanied by a residual acidosis even if no ketone bodies develop. It may be the preliminary stage of coma, but acidosis may also be a component of hypoglycemic shock; that is, the sequel of excessive insulin dosage. The hypoglycemic shock elicited by depot insulin is especially insidious and may prove refractory to treatment. The more severe the diabetes the more difficult it is to prevent coma on the one hand and shock on the other. For this reason the author advises against the use of depot insulin in cases of severe diabetes. Acidosis as a factor of diabetic coma as well as of glycoprivic shock is most effectively counteracted by the administration of alkaline substances. A diet with an excess of alkalis has a prophylactic effect against both conditions. The author administers small doses of ordinary insulin (5 to 10 units) in some cases of serious insulin shock. This may appear paradoxical, but the small dose has the opposite effect of the large dose: it produces alkalosis rather than acidosis. In cases in which it is difficult to differentiate between shock and coma the author gives sugar plus alkaline substances and, under certain conditions, a small dose of insulin. Whereas a large dose of insulin might be harmful, a small dose may be helpful. This is done only in doubtful cases, since large doses of insulin are indicated in the presence of coma.

Zeitschrift für Urologie, Leipzig

35:141-184 (No. 4) 1941

*Transurethral Resection or Prostatectomy in Hypertrophy of Prostate. H. Hoess.—p. 141.

Surgical Treatment of Hermaphroditism. A. Schmidt.—p. 152.

New Preparation to Facilitate Gliding of Catheters. F. May.—p. 170.

*Aspects of Induratio Penis Plastica, with Special Consideration of Relation to Dupuytren's Contracture. W. Volavsek.—p. 173.

Transurethral Resection or Prostatectomy.—Hoess objects to the statement that prostatectomy is superior to transurethral resection in the treatment of hypertrophy of the prostate. Prostatectomy obtains a more radical effect by a more extensive and serious intervention, whereas transurethral resection obtains a limited effect with less danger. The efficacy of both methods depends on the proper selection of cases. Since the two methods are of equal value, it must be decided which of the two is better suited for the individual case. Since transurethral resection is the less radical and less dangerous of the two, it is advisable to investigate first whether it can be used. This will depend on whether the mechanical obstruction predominates and whether the size, position and shape of the obstructing adenoma are sufficiently accessible for the resection loop. If transurethral resection does not appear adequate for the removal of the obstruction, suitability of prostatectomy must be determined. In the absence of the requirements for the execution of this radical operation the punch method could be used in an emergency, provided the general condition does not make even this method seem too risky and indicates resort to a still less harmless provisional measure.

Induratio Penis Plastica and Dupuytren's Contracture.

—On the basis of observations on 198 patients with induratio penis plastica, Volavsek accepts a hereditary predisposition of the connective tissue to proliferation and shrinkage as the chief causal factor. He does not deny, however, that stimuli of a mechanical traumatic nature or hormonally conditioned tissue changes also play a part. The theory of the hereditary transmission is supported by the fact that 4.6 per cent of patients with induratio penis plastica had Dupuytren's contracture, the familial character of which seems definitely established. Of 26 patients with Dupuytren's contracture 9 had induratio penis plastica. The author considers radium irradiation as the most effective treatment of the condition. Disregarding the cases in which radium treatment had been incomplete and those in which follow-up observation was impossible, it was found that radium irradiation had counteracted all manifestations in 32.8 per cent of the cases, that 47 per cent had been greatly improved and that 20 per cent remained uninfluenced. Calcium or bone inclusions, if present, must be removed by surgery before radium treatment is begun.

Bulletin of the Naval Medical Association, Tokyo

30:263-322 (May) 1941. Partial Index

*Results of Vitamin B₁ Tolerance Study in Man. I. Ishihara.—p. 303.

Vitamin B₁ Tolerance in Man.—Ishihara reports the results of his observations on vitamin B₁ tolerance in 10 patients free of any evidence of vitamin B₁ deficiency and in 14 patients with various degrees of beriberi. The test substance was a crystalline preparation of vitamin B₁, which was injected intramuscularly in a standard dose of 10 mg. The diet of these subjects contained about 80 per cent of rice germ in a total ration of 2,500 Gm. of unpolished rice. It was found that in nonberiberic patients nearly 50 per cent of the injected vitamin is excreted in the urine during the twenty-four hours, the greater part of which is found in the urine collected during the first three hours following administration. When the vitamin is injected intraspinally the excretion in the urine is reduced to approximately one half, indicating the therapeutic efficacy of this method of vitamin administration. In the patients who are suffering from active beriberi, on the other hand, the urinary excretion of the injected vitamin amounts to only 18 per cent during the first twenty-four hours. This observation suggests the possibility of utilizing the method of tolerance study as a means of obtaining additional evidence in the diagnosis of clinical or subclinical beriberi.

Mitt. a. d. med. Akad. zu Kyoto, Kyoto

31:1033-1334 (April) 1941. Partial Index

*Physicochemical and Biologic Studies of the Serum and Pleural Exudate. S. Fukugita.—p. 1299.

*Experimental Studies on Emesis. M. Hayakawa.—p. 1302.

Serum and Pleural Exudate in Pleurisy.—Fukugita studied the chemical and physical nature of blood serum and pleural exudate in cases of pleuritis and ascertained their biologic behavior by testing the effect on tissue respiration, using organs of both normal and tuberculin-sensitized guinea pigs. By the use of the Warburg respirometer method the author found that, as compared with the tissues suspended in Ringer's solution, the serum and the exudate of pleuritic patients exhibited higher rates of respiratory exchange with brain, lung, liver and spleen. As compared with the respiratory activity of normal serum, however, the serum of pleurisy patients showed a lower respiratory rate, but the pleural exudate showed little effect when compared with the action of normal blood serum. The respiration of brain, lung and liver tissues suspended in the pleural exudate of pleuritis patients was accelerated, but no changes were noted in the respiration of kidney and spleen. The respiration of the tissues from tuberculin-sensitized animals, however, was greatly accelerated in the normal serum as well as in the serum and exudate of pleuritis patients. The tissue respiration of brain and liver is identical in the serum of normal individuals and of pleuritic patients but it is decreased in lung, spleen and kidney as compared with that of normal serum. This decrease is less with lung and spleen but greater with kidney when the tissues are obtained from sensitized animals. The tissue respiration of brain and liver is the same whether the serum is from normal or abnormal subjects, but the respiration of the lung and spleen is depressed and that of the kidney slightly accelerated. The tissue respiration of brain and liver in pleural exudate is the same as that of serum, but it is increased in the lung, definitely accelerated in the kidney and depressed in the spleen of sensitized animals.

Experimental Studies of Emesis.—Hayakawa endeavored to ascertain the relation between the intragastric pressure and the artificial tension of the abdominal muscles in the causation of vomiting. As an emetic the author employed 0.1 per cent solution of apomorphine hydrochloride, and for the production of muscle tension from 1.5 to 4 cc. of oil of turpentine was injected either intraperitoneally or intramuscularly. The intragastric pressure was observed on a manometer connected with a stomach tube. The results of observations are as follows: Increased tension of the abdominal muscles inhibits emesis.

induced by apomorphine, the intragastric pressure during vomiting is usually around 20 mm of mercury but in the presence of abdominal tension rises to 31 mm. Apomorphine and the elevation of intragastric pressure appear to have a mutually accelerative action in the causation of emesis. The intragastric pressure in experimentally produced apomorphine emesis is usually around 20 mm of mercury, while in the presence of induced abdominal muscle tension it reaches 30 to 60 mm. Oil of turpentine, if injected in other portions of the body, exerts no effect on emesis.

Tokyo Igakkwai Zassi, Tokyo

55:275-372 (April) 1941 Partial Index

*Studies on the Pathologic Anatomy and Histology of Melanosis of the Colon T. Tanaka—p. 325

Melanosis of Colon—Tanaka was able to demonstrate melanosis of the colon histologically in 72 cases in a total of 624 necropsies, on the basis of which, together with cases of grossly visible melanosis, he records the following observations. Although the condition is found in all age groups, the greatest incidence occurred after the third decade of life and the youngest was an infant 1 year old. The association of melanosis is found most frequently in the gastrointestinal and cardiovascular diseases, particularly of malignant type. The stools were either normal or but slightly diarrheic. Grossly the pigmentation appeared light yellow or brownish yellow with a certain amount of luster, the cecal area showed the greatest predilection, and the deposit may be either in streaks or in groups. The distribution of the pigment cells is diffuse, these cells being present in all layers of the mucosa, in mild melanosis the tendency is toward superficial distribution, and in severe cases the pigment appears in the deeper layers. The largest collection of the pigment cells usually occurs in locations characterized by an active flow of lymph, occasionally the pigment was observed in the lymphoid follicles. No apparent relation exists between the degree of the melanosis and the pigment cells present in the mesenteric lymph nodes. The pigment is absent in the lower portion of the rectum, in parallel with the disappearance of the crypts. The melanosis is definitely a function of the histiocytes, since no pigment was demonstrable in the lymphocytes. The pigment cells may be classified as (1) fixed cells, including reticular cells, endothelial cells and connective tissue cells and (2) wandering cells, including both type R and type H histiocytes. The author regards the pigment in melanosis as being derived from protein and not from blood or fat, and as resulting from pathologic changes in the intestinal contents and from functional disturbance of the intestinal mucosa. The abnormal deposit of pigments occurs first on the mucous surface and is then carried into the deeper tissues by the lymphatics and lodged in the reticular tissues.

Vestnik Khirurgii, Leningrad

61:1-108 (Jan) 1941 Partial Index

Local Anesthesia with Soveain B. M. Chernakov—p. 3

Anesthesia of Pelvic Organs S. I. Elizavrovskiy—p. 8

*Combined Universal Blood V. I. Sazontov—p. 15

Pathogenesis of Postoperative Hematoma V. A. Kartavyn—p. 19

Combined Universal Blood—Sazontov took advantage of the fact that blood of group O contains no agglutinogens and that plasma of group AB contains no agglutinins and, by combining the morphologic elements of the former with the plasma of the latter, produced a blood which has no agglutinogens and no agglutinins. He called this blood combined universal blood. On conservation of this blood it was noted that its hemoglobin remained unchanged for from twenty to twenty five days, the erythrocytes for from thirteen to fifteen days. Forty nine transfusions were given to 22 patients without any objective or subjective untoward reaction being encountered. The transfusions were made without regard to blood grouping and without the biologic test. The discarded plasma of group O is utilized by the author for stimulation in a number of diseases while the erythrocytes of group AB are mixed with physiologic solution of sodium chloride and are utilized for transfusion. The univer-

sally combined blood solves the problem of the universal donor. It eliminates reactions due to direct or reversed agglutination. It makes it unnecessary to determine the blood group of the recipient.

Maandschrift voor Kindergeneeskunde, Leyden

10:83-128 (Dec) 1940 Partial Index

*Acute Lymphatic Leukemia with Leukemic Thymus Tumor Cornelis de Lange—p. 83

Psychomotor Disturbances in Children with Retarded Speech Development F. Grewel—p. 90

Treatment of Congenital Hypertrophy of Pylorus J. Drukker—p. 105

*Congenital Malaria G. J. van Lookeren Campagne—p. 111

Acute Lymphatic Leukemia with Thymus Tumor—De Lange states that, although present day physicians know how to make and examine a blood smear, leukemia in children is rarely recognized by the practitioner. At the author's hospital 2 such cases were observed recently which had been diagnosed as parotitis. One of the patients was a boy aged 2½ years in whom acute lymphatic leukemia terminated fatally within six weeks. The number of leukocytes was between 300,000 and 400,000. Roentgenoscopy of the chest showed on the right side, in connection with the heart, a large, sharply defined shadow. The necropsy and microscopic examination revealed a large leukemic tumor of the right lobe of the thymus. The leukemic process had changed the structure of the thymus considerably. It is known that in some cases of lymphatic leukemia an organ or part of an organ (intestinal tract) may show such an increase in volume that it may be taken for a malignant growth, a lymphosarcoma. In such cases the swelling of the spleen and lymph nodes may be slight, which, however, was not the case in the boy under consideration. Thymoma leukemicum, the term applied to the boy's tumor, is of rare occurrence.

Congenital Malaria—An infant of 6 weeks was brought to van Lookeren Campagne because he presented symptoms of anemia. In the course of the differentiation of the white blood picture a malarial parasite was discovered. Inquiry disclosed that before and during the first months of pregnancy the mother had had malaria. Later the malaria had been treated with quinine, and since returning to the location where later the child was born the mother had been free from the symptoms of malaria. The child had not lived in a malarial region. A second blood examination disclosed a number of schizonts, young ring forms as well as full grown parasites. Temperature controls disclosed that every night it reached 39 C (102.2 F). The infant recovered after treatment with a quinine preparation and blood transfusions. The author points out that the question of congenital occurrence of malaria has long been disputed, but he thinks that in the reported case it is highly probable that the malaria was congenital.

Acta Medica Scandinavica, Stockholm

107:179-504 (May 14) 1941

Bleeding Tendency in Diseases of Liver and Biliary Passages P. M. Aggeler and S. P. Lucia—p. 179

*Symptomatology of Aleukemic Paramyeloblastic Leukemia O. K. Evensen and H. Schartum Hansen—p. 227

Relation Between Light and Epidemic Curve of Poliomyelitis with an Attempted Epidemic Theory Explaining Epidemic Waves as Statistical Consequence of Mechanism of Infection A. Theoretical Part H. Petersen—p. 282

Id. B. Numerical Part and Conclusions H. Petersen—p. 310

Thrombosis in Portal Vein in Connection with Hepatic Cirrhosis Lauri Kalaja—p. 359

Clinical Aspects of Hoof and Mouth Disease in Human Subjects in Light of Most Recent Research T. Stenstrom—p. 372

*Spontaneous Subarachnoid Hemorrhage (Symptomatology, Roentgenation Prognosis) H. C. A. Lassen and T. V. Varggaard—p. 391

Use of Vitamin B in Therapy of Neuritis and Neuralgia Lauri Kalaja—p. 427

*Koch's Bacilli Manifested in Tissue of Lymphogranulomatosis Benigna (Schrummann) by Using Hallberg's Staining Method J. Schrummann and V. Hallberg—p. 429

Aleukemic Paramyeloblastic Leukemia—Evensen and Schartum Hansen report 22 cases of aleukemic paramyeloblastic leukemia. In all but 1 the diagnosis was verified by sternal puncture. The youngest of their patients was 2½ years old, the oldest 71. The duration of the disease varied between 1 to 9

and fifteen months. The course of the disease was more rapid in younger patients. A progressive normocytic or slightly macrocytic anemia, a normal or frequently a reduced number of leukocytes and constant granulopenia with more or less pronounced lymphocytosis were usual. Paramyeloblasts were seen in the smear preparation of the peripheral blood. Hematologic changes of this kind may be the only objective finding for a long time, especially in older patients. A thrombopenia appears regularly. When it is difficult to distinguish between small paramyeloblasts and lymphocytes in smear preparations of the ear, blood sternal puncture is of great diagnostic aid, as a homogenous paramyeloblastic marrow with up to 100 per cent of paramyeloblasts is always found. In 5 patients the disease began with painful joints, occasionally accompanied by considerable articular swelling and fever, and in 2 these symptoms appeared later. As the sedimentation rate is always greatly increased, the disease might be mistaken for acute rheumatism. A moderate enlargement of the spleen was found in 5 patients on admission, and later in the course of the disease in 4 more. In 12 a slight enlargement of the liver was found, 6 of them presenting an enlarged spleen at the same time. Enlargement of the spleen and liver was observed only in the younger patients. Only 1 patient presented severe general swelling of the lymph nodes and 9 moderate to slight enlargement. Three of the 22 patients had spontaneous remissions lasting from three to five months.

Spontaneous Subarachnoid Hemorrhage.—Lassen and Vanggaard report 43 instances of spontaneous subarachnoid hemorrhage. The disease is rare in the first and after the sixth decade of life; half of the patients were less than 40 years of age. Headache was present in the initial stage of 42 patients (most often apoplectiform in onset and extremely violent); pain in the neck or back was present in 15, vomiting in 37, dizziness in 14, mental haziness in 28 and complete but brief loss of consciousness in 17. Nuchal rigidity was present in 40 patients, convulsions in 5, visual disturbances in 5, unilateral or bilateral Babinski's sign in 22, absence of abdominal reflexes in 12, slight focal symptoms in 16 and massive focal symptoms in 3. The systolic blood pressure of 40 patients in the initial stage of the disease was less than 140 mm. in 20, slightly increased in 13 and definitely increased in 7. Thirteen of 32 patients presented ophthalmoscopic congestion of the retinal blood vessels and sometimes hemorrhage. Six of the 13 had a systolic blood pressure of more than 190. In the beginning of the disease the spinal fluid of all patients was sanguinolent or xanthochromic and later presented mononuclear pleocytosis. After the initial stage most patients had a moderate rise in temperature lasting from eight to fourteen days. In 26 of the 31 discharged patients the headache disappeared within three weeks, in all of them within from four to five weeks. The rigidity of the neck subsided completely within six weeks. Consciousness returned most often in one or two days; in a few patients coma persisted to the end. Focal symptoms most often subsided rapidly. Proof of repeated hemorrhage was observed only once or twice. It seldom recurs after a free interval of three months. Spinal puncture was often of symptomatic and therapeutic value. Renewed bleeding was ascertained in only 1 of these patients. Six patients were examined post mortem, and the diagnosis of subarachnoid hemorrhage was confirmed. The cause of the hemorrhage, a hemorrhagic pachymeningitis, was demonstrated in only 1 instance. At reexamination of 27 of the 31 discharged patients 20 were fully able to work, 6 partially able and 1 was completely disabled. Twenty-four patients had some inconvenience or discomfort, headache, nervousness or impairment of memory. The prognosis appears to be worse if the patient has had previous manifest subarachnoid hemorrhage or acute cerebral phenomena with similar clinical features. No plausible etiologic factor could be deduced in 16 patients, in 18 the possible pathologic factors were hypertension, a positive Wassermann reaction of the blood and spinal fluid without clinical signs, hemorrhagic diathesis (thrombopenia), hemorrhagic pachymeningitis and a possible aneurysm of the basilar artery (clinical diagnosis) and in 9 the etiology was questionable.

Tubercle Bacilli Demonstrated in Tissue of Lymphogranulomatosis.—Schaumann and Hallberg demonstrated with Hallberg's "nachtblau" staining method in the glandular tissue of benign lymphogranulomatosis fungous elements which conform to Reenstierna's mycotic tubercle micro-organism. In one section, besides fungous elements, acid-fast rods having the morphologic and staining characteristics of Koch's bacilli have been found in two places. By successive inoculation of benign lymphogranulomatosis tissue in guinea pigs the virulence of the bacilli has been enhanced and animals have sometimes been successfully tuberculized and culturable bacilli obtained. The tuberculous nature of benign lymphogranulomatosis is strongly supported by the frequent appearance during its course of a bacillary tuberculosis and in an especial degree by the simultaneous disappearance of the benign lymphogranulomatosis lesions (Schaumann 1922). The absence, or the paucity, of bacilli in benign lymphogranulomatosis tissue is, in the authors' opinion, associated with a peculiar tuberculin anergy present in these cases. This anergy indicates immunologic resistance to tubercle bacilli which impedes the condition of their life and reduces their vitality or destroys them. The negative results obtained by inoculating guinea pigs with material from a gland in which bacilli were demonstrated do not support the assumption that these bacilli are special micro-organisms conforming closely to Koch's bacillus, but that the bacilli are in reality Koch's bacilli and that benign lymphogranulomatosis is a tuberculous disease.

Nordisk Medicin, Stockholm

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Hospitalstidende

*Treatment of Suppurative Otitis Media of More Than Thirty Days' Duration in Children. E. L. Hoffmann.—p. 1599.

Extra-Uterine Pregnancy in Tuberculous Fallopian Tube: Case. Karen Røjel.—p. 1604.

Treatment of Suppurative Otitis Media in Children.—

Conservative treatment for more than thirty days was given in 128 cases of suppurative acute otitis media. In the 6 adults the results were unsatisfactory. Of the 122 children, 13 had to be operated on later, and 2 died; 109 were discharged after an average of seventy days with good results in 90 per cent, fair results in 7 per cent and a mortality of 3 per cent. Hoffmann says that while the small number of cases in which operation was performed is the obvious advantage of the conservative method, the hospital treatment is long and expensive.

Hygiea

*Thymus Changes in Myasthenias. K. Boman.—p. 1625.

Obstructed Cecum. G. Hagblom.—p. 1634.

Atypical Tuberculosis: Two Cases of Generalized Caseous Tuberculosis in Lymphatic and Hematopoietic System. C. S. Backman.—p. 1639.

Thymus Changes in Myasthenias.—Boman states that thymus hyperplasia or thymomas have been established in at least 50 per cent of the cases of myasthenia gravis. Guanidine-prostigmine treatment of myasthenia gravis is considered the best internal therapy. Roentgen irradiation of the thymus has been ineffective. To date it is not possible to evaluate the treatment of myasthenia gravis by the removal of thymus hyperplasias or thymomas, because of the high mortality due to the technical difficulties in operation and the lowered resistance to infections in the postoperative course. Although the genesis of myasthenia gravis is still uncertain, a causal relation between myasthenia symptoms and the changes in the thymus is indicated. When the patient has survived the operative treatment a striking improvement has resulted. In the most successful cases the myasthenia has gradually assumed a latent form and given symptoms only in connection with exertion or infections. The thymus changes and thymomas seen in myasthenia gravis vary greatly both clinically and histologically. The morphologic variations may perhaps be the expression of different functional conditions, which might explain the variation in the clinical course of myasthenia gravis. In the 2 cases described there was rapid tiring on exertion without the involvement of any special group of muscles.

Book Notices

The Periodicity and Cause of Cancer, Leukæmia and Allied Tumours with Chapters on Their Treatment. By J. H. Douglas Webster, M.D., F.R.C.P.E., F.F.R. Cloth. Price, \$3.50. Pp. 178, with 5 plates. Baltimore: William Wood & Company, 1940.

The author, a well known radiologist, has long been interested in the study of the growth rate of human cancer. The fact that malignant tumors have periods in which they grow rapidly, often though not invariably followed by a latent stage, has been known by clinicians for many years. Pathologists have long noted that the number of mitotic figures, for example, varies enormously from time to time, as determined by multiple biopsies on the same neoplasm. The rhythms of growth noted in grafted animal tumors are dependent more on the nutritional arrangements between the animal host and the tumor and the rise and fall of tissue immunity, owing to the fact that a graft is to a certain extent, even though growing, a foreign material, so that this observation made by Bashford many years ago is not of great interest. When selected stocks homozygous for the tumor inoculated are employed, no such rhythms are noticeable. In general, pathologists have been inclined to assume that these changes in growth rate of observable tumors were due to alternations between necrosis of the tumor with shrinkage and, after the necrosed material has been absorbed, renewed growth, which again increased the size of the neoplasm. In other words, it was largely a question of nutrition. But Webster does not think that this is the best explanation. He assumes that "periodicity is a fundamental, intrinsic characteristic of human neoplastic disease," even though he grants that such periodicity affects only about 90 per cent of human cancers. He also believes that tumors are due to virus action and points out certain fluctuations in rate of growth or the appearance of cancer or metastases during epidemics of influenza, also a virus disease.

The author correctly assumes that endocrine factors may play a part in the growth rhythms of tumors of, for example, the breast and uterus. A long series of cancer cases is cited which serve as material for a series of charts revealing a thirty-three week peak of either rapid growth or of recurrences. He gives similar charts of Hodgkin's disease and leukemia. He believes too that a trauma of a tumor may induce a recurrence of cancer, either immediately or after a latent interval of weeks or months, according to the periodicity stage of the primary tumor. Webster thinks that periodicity observations may have some practical value in the application of radiotherapy. Not every one would agree with the inclusion of Hodgkin's disease as a malignant tumor, nor would every one go so far as to accept some of the statements which he quotes in favor of the use of a series of chemicals in the treatment of malignant disease. A fairly competent bibliography is appended, and the author's ideas may prove of value in suggesting further studies on the biology of human growths.

New and Nonofficial Remedies, 1941, Containing Descriptions of the Articles Which Stand Accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1941. Cloth. Price, \$1.50. Pp. 691. Chicago: American Medical Association, 1941.

The increasing size of *New and Nonofficial Remedies* in the last few years is concrete evidence of the recent advances in chemotherapy and of the increasing value being placed by pharmaceutical manufacturers and distributors on acceptance of their products by the Council on Pharmacy and Chemistry. Notwithstanding the numerous deletions recorded in the preface, this year's volume is substantially larger than the 1940 edition.

This year's new additions include the new sulfanilamide derivatives sulfathiazole as well as sulfapyridine sodium; antipneumococcic rabbit serum of types I, II, III, V, VII and VIII; human convalescent measles serum and human convalescent scarlet fever serum, and staphylococcus antitoxin. The field of endocrinology is represented by the addition of chorionic gonadotropin (follutein). The addition of shark liver oil reflects the search for new sources of vitamins A and D caused by the

cutting off of foreign cod liver oil. Other newly accepted preparations are ampules of camphor, digilamid and magnesium trisilicate.

The most extensive revision is represented by the rearrangement and amplification of the chapter on serums and vaccines. This chapter is now prefaced by a helpful index, an innovation in N. N. R. The chapter on vitamins and vitamin preparations for therapeutic and prophylactic use has been revised to keep it abreast of the newer developments in this field. Here too is an innovation in the systematic use of graphic chemical formulas. This practice is to be extended to other parts of the book in future editions. Careful perusal will reveal minor revisions in many parts of the book made in the interest of greater clarity and in the effort to keep the book thoroughly up to date.

Neuro-Ophthalmology. By R. Lindsay Rea, B.Sc., M.D., M.Ch., Ophthalmic Surgeon to West End Hospital for Nervous Diseases, London. Second edition. Cloth. Price, \$13.50. Pp. 688, with 218 illustrations. St. Louis: C. V. Mosby Company, 1941.

The first edition of this work was reviewed in *THE JOURNAL*, Sept. 17, 1938. Revision for the present edition appears to have consisted in the addition of an appendix of 110 pages with little if any alteration in the original text. The result is that this work, which was described by the earlier reviewer as a "little unsystematic," is now seriously lacking in organization. The same subject is often discussed repetitiously in several places and not always with complete agreement. Thus the neural mechanism concerned in the pupillary light reflex is discussed on page 15, on page 30, on pages 31 to 34 and again on pages 519 and 520 of the recently added appendix. There is much information of interest and value in the book, but this lack of organization, as was also noted in 1938, makes it difficult to find and greatly lessens the value of the book as a reference work. This difficulty is enhanced by the fact that in the index many pages are often cited after a single topic without any designation as to which pages contain the really important discussion of the subject. Thus there are twelve separate citations for glaucoma without any distinction as to the pages on which glaucoma is merely mentioned or where a thoroughgoing discussion of this important subject can be found. In this connection any mention of the alterations in the visual fields characteristic of glaucoma completely escaped this reviewer.

Much of the discussion is superficial and uncritical. Dogmatic statements are made without supplying the reader with any reasons or explanations, and quotations from the literature of questionable accuracy and value are presented without comment by the author. Important details are often omitted. Thus on page 113 in a discussion of the course of the fibers through the optic nerves, chiasm and tracts the disposition of the all important macular fibers in the chiasm is far from clear. On page 166 the paragraph beginning "Epileptiform attacks" is so confused as to be meaningless. On page 186 it is stated that "It is the consensus of most observers that . . . it is practically-impossible to see the condition [a Kayser-Fleischer ring] with the naked eye," and then on the opposite page there is illustrated the typical "naked eye appearance" of such a ring as is familiar to most neurologists. The two cases presented on pages 286 to 288 to illustrate the effect of the roentgen rays on pituitary tumors are extremely questionable examples of this condition and an unfortunate choice. The condition described on page 336 is certainly very atypical for "idiopathic epilepsy." The statement on page 468 that "Pellagra is a disease about which a great deal has been written and yet so little has been elucidated regarding its cause" is certainly not in keeping with modern developments nor with pages 621 and 622 of the appendix. There are numerous frank errors. The illustration on page 115 and the statement on page 117 that part of the visual radiations arise from the pulvinar finds no support in the intensive research in this field of the past fifteen to twenty years. The illustration on page 118 gives an erroneous impression of the extent of the visual area (area striata) on the lateral surface of the human occipital lobe. The statement on page 136 "If there is pressure on or disease of the upper or lower surface of the chiasm there will follow respectively an inferior or superior altitudinal hemianopia" is not in accord with clinical facts. Nor does thrombosis of the posterior cerebral artery

produce "a hemianopia of the superior quadrant" (pp. 136 and 137). Lesions of the optic tract rarely if ever result in a homonymous hemianopia with sparing of the macula as illustrated in figure 54 and described on page 137.

The statement on page 159 that the pyramidal tract decussates in the lower part of the pons is wholly in error, as is the statement on page 172 that astrocytomas are among the most malignant types of tumors, are highly cellular and are liable to metastasis. One could hardly agree that "a ptosis with a dilated pupil on the same side is almost pathognomonic of an ipsilateral, cerebral or cerebellar abscess" (p. 172) or that "In abscess of the cerebellum conjugate deviation (of the eyes) is always present" (p. 173).

The typography is pleasing. The illustrations, notably the colored plates, are well reproduced. The heavy paper has resulted in an unnecessarily heavy and bulky volume. There is an extensive and well chosen bibliography of forty-seven pages.

Certainly one must agree with the reviewer of 1938 that a book correlating the material common to the fields of ophthalmology and neurology is needed. However, until this book has been suitably organized and the numerous errors of which the foregoing are examples are eradicated this work cannot be considered as adequately filling that need. It seems likely that collaboration with an experienced neurologist would greatly improve the book. Nevertheless it must be recognized that this book contains much valuable information and will prove useful to many workers in these fields.

Start Today: Your Guide to Physical Fitness. By C. Ward Crampton, M.D., Major, Medical Reserve Corps, United States Army. Cloth. Price, \$1.75. Pp. 224, with illustrations. New York: A. S. Barnes & Company, 1941.

This book is dedicated to the thesis, now growing in popularity among physical educators, that the nation will be saved through strengthening its recti abdomini. To this end exercise is prescribed; hard, strenuous, much of it of a character which even the author warns is not suitable for many readers unless advised by a doctor "who knows muscle as well as medicine." It is claimed that there are three kinds of exercises—the anatomic, which help the posture but do little for the physiology, the physiologic, which do marvelous things for the vital organs, and the psychologic, which help the mind and the personality. Admitting the undoubted value of exercise in stimulation of circulatory functions and respiration, and the probable secondary benefits to all the tissues, it is too much to ask that the reader accept such fanciful conceptions as that laughter causes the diaphragm to pat the liver on the back, and so if you can laugh you can create cause for laughter; or that "a strong abdominal wall is a pledge of length of days." Too much emphasis is placed on the importance of abdominal ptosis as a cause of symptoms. Without actually using the word, the outworn theory of autointoxication is suggested in connection with constipation. Certain exercises of the spine are commended as "a self-applied semichiropractic treatment which has helped to take many spines out of a discontented state and make them happy again." Even in the good chapter on diet the reader is admonished to get his milk and cream while it is fresh and "alive"—a typical food faddist dictum—though elsewhere appear proper warnings against faddism. The "prescription" breakfast food containing agar, vitamin B complex, figs, raisins, bran (possibly) and milk sugar offers no advantages and some possible disadvantages when compared with ordinary fruit and cereal breakfasts. Brown sugar and molasses, highly recommended, have no particular advantage, except where there is a taste preference, over white sugar used in equal moderation.

The book has so many good points, such as frequent admonitions to do physical conditioning under medical supervision and to have a periodic health examination, that it is a pity it could not have been made a better and safer book by omission of the extreme claims and the inaccuracies, of which typical ones have been pointed out.

The style is staccato, original and stimulating. The illustrations are good and the descriptions of the exercises are clear. For those who want exercise and will take it with due regard for physical needs and limitations, this is a good book. It is quite true, as stated in an editorial foreword quoted from THE

JOURNAL, that the physical condition of the American people requires attention and that physical educators have their part to play. But it does not follow that exercise in bed and out, with a complimentary bow to diet, will be the sole solution of the problem.

Theory of Occupational Therapy for Students and Nurses. By North A. Haworth, M.A., M.R.C.S., L.R.C.P., Hon. Assistant Physician, Lady Chichester Hospital for Functional Nervous Diseases, Hove, and E. Mary Macdonald, Occupational Therapist in charge of the Allendale Curative Workshop, Bristol. With foreword by Sir Robert Stanton Woods, M.D., F.R.C.P., Consultant Adviser in Physical Medicine to the Ministry of Health. Cloth. Price, \$2. Pp. 132, with 81 illustrations. Baltimore: William Wood & Company, 1941.

This elementary book by British authors makes clear the position which directed occupation takes among remedial measures that are helpful in a wide variety of disorders and disabilities. They do not claim that it can be regarded as a "cure" but consider it merely an adjunct to other treatment. Much of the success to be derived from it depends on the tact, sympathy and understanding of the therapist, who should know the objective of treatment.

The brief historical sketch of occupational therapy opens with mention of its use in Egyptian temples. Seneca and Galen advocated it. Pinel in France, Benjamin Rush in the American colonies, and the Tukes in England had no little part in calling attention to the value of work as treatment for mental patients. At Gütersloh in Germany, work became the chief therapeutic approach of all those who helped to care for patients. The authors report the opening of the first school of occupational therapy in Chicago in 1915.

Short chapters are devoted to the application of work to patients with various mental illnesses and with general physical illness of a chronic nature, including tuberculosis. It has great value for those disabled with injuries and diseases of bones and joints. A distinction is drawn between the use of work as an active therapeutic agent and its role to help those keep fit who are not expected to recover. Nurses are encouraged to know more of the uses of arts and crafts to supplement the efforts of trained occupational therapists. Some pages are devoted to techniques and materials, which do not include many developed within the last few years. Financing, use of storage space and waste materials are briefly but well discussed. A short bibliography is appended. The book is indexed. As an elementary manual in the hands of inexperienced workers it has usefulness; it falls far short, however, of presenting occupational therapy in a comprehensive way.

The Diagnosis and Treatment of Diseases of the Heart. By Henry A. Christian, M.D., Sc.D., LL.D. Reprinted from Oxford Monographs on Diagnosis and Treatment. New edition. Cloth. Price, \$7. Pp. 598, with 28 illustrations. New York, Toronto & London: Oxford University Press, 1940.

This book is a new and thoroughly revised edition, reprinted from the Oxford Monographs on Diagnosis and Treatment. It is a clear discussion of diseases of the heart, based on the long and rich experience of one of the ablest clinicians in this country. It is not a simple or exhaustive summary of the available knowledge on the etiology, pathology, physiology, symptomatology, classification, prognosis and treatment of cardiac disorders but rather an advanced discussion of these aspects of diseases of the heart by a master, addressed to students and practitioners of some clinical experience. The book also contains valuable analysis of the carefully studied clinical material in the Peter Bent Brigham Hospital.

The introduction contains an expression of some of the author's philosophy on the general approach to modern clinical medicine. Physicians will benefit from reading this chapter. The writer exhibits great skill in applying physiologic, biochemical and morphologic contributions in the explanation of clinical manifestations. The chapters on endocarditis, on acute myocarditis and on chronic myocardial diseases are particularly rich in useful information. There are a number of original and provocative conclusions. Chapter xvii, on the diagnosis and treatment of certain rarer conditions, contains clinical data not available in most of the textbooks on the subject. The book closes with a detailed and excellent discussion of the pharmacologic action of the digitalis drugs. Each chapter ends with a selective list of references to the literature.

One may raise the question whether the lack of illustrations handicaps the usefulness of the book. In these times, when so many textbooks are published jointly by several authors and often by less experienced students in the field, this book, so concisely, clearly and critically written and so full of clinical advice and detailed description of treatment, fills a definite need. It stands out among the many books on heart disease. On reading this volume, one obtains also a good picture of the relation of recently acquired medical knowledge to the significant contributions of the great clinical school of the opening of the present century. This book is highly recommended to students and physicians interested in cardiology.

Psychologie und Psychotherapie der Herz- und Gefässkranken: Eine klinisch-experimentelle Darstellung für Studierende und praktische Aerzte. Von Dr. Berthold Stokvis, Nervenarzt, Dozent für experimentelle Psychologie an der Reichs-Universität Leliden. Paper. Price, 12 Dutch florins; 20-marks. Pp. 401, with 11 illustrations. Lechem: N. V. Uitgeverijmaatschappij "De Tijdstroom," 1941.

This is an excellent and complete compilation. The author shows an intimate acquaintance with the immense literature on the subject of psychosomatic phenomena and a solid knowledge of the problem of cardiovascular diseases. He cites a number of clinical cases which he himself has observed. While recognizing the role which anxiety plays in the formation of neurotic symptoms referable to the cardiovascular system and the neurotic utilization of actual organic cardiovascular defects, the author is not clear as to the actual dynamics of the psychologic problems involved. This is a good reference book, but unfortunately it contributes little to the solution of the problem of differential diagnosis. The author insists that the diagnosis of a psychogenic origin of cardiovascular complaints should not be made by the method of exclusion, for the fact that actual organic disease is excluded by means of careful physical and laboratory examination is not sufficient for a diagnosis of a neurosis. One must produce positive proof of psychologic etiology. This is a timely insistence; unfortunately, the author is not specific as to how this positive proof ought to be elicited. His discussion of cardiac insufficiency, psychogenic angina pectoris and essential hypertension is orderly, systematic and thorough, and he stresses the importance of psychotherapy in all conditions psychogenic or somatogenic. His psychotherapy is too general and eclectic to permit evaluation of its validity. No doubt the author has had wide experience with the clinical conditions with which he deals. The fact that in his practical considerations of the problem he draws on a number of American contributions is rather indicative of the advances made in the United States in the study of psychosomatic problems. Despite the author's emphasis on psychotherapy, his psychotherapeutic views are more theoretical than practical. There are a forty-two page bibliography and a good index.

A Complete Outline of Fractures (Including Fractures of the Skull) for Students and Practitioners. By J. Grant Bonnin, M.B., B.S., F.R.C.S., First Assistant to the Injury Clinic, West London Hospital, London. Cloth. Price, 25s. Pp. 507, with 575 illustrations. London: William Heinemann, Ltd., 1941.

The production of such a book under the trying conditions of war represents a real triumph of medical effort. There is no question that this book can meet many of the needs for which it was designed. Under existing circumstances where every physician may find himself obligated by military situations to have a practical knowledge of the treatment of fractures, this book is almost ideal. Its thoroughness is merely emphasized by the brevity of presentation. Numerous photographs and drawings illustrate many points difficult to describe. The book begins with a general discussion of fractures, including definitions, pathology and other fundamental principles. Complications, the treatment of associated wounds and equipment are then considered. The value of tetanus prophylaxis and the use of chemotherapy are mentioned. The direct instillation of sulfanilamide and its derivatives into wounds associated with compound fractures is not mentioned. This is surprising in view of the fact that these substances are recommended by the author for oral use in infected wounds. Possibly not enough material is included on the treatment of infected compound fractures, especially of the more recent war experiences. The discussion of head injuries is of paramount significance and is fairly thorough. Treatment advocated is conservative and not unlike

that practiced by most large clinics in this country. The remainder of the book deals with the various types of fractures usually encountered and invariably follows standard procedure. An excellent bibliography follows each chapter, and there are several valuable tables. This book is prepared in part for the student and has an appendix containing sample questions. There is also a comprehensive table of periods of immobilization and fixation. This book should prove useful to all who desire a practical knowledge of the treatment of fractures.

Histopatología del cerebelo en la parálisis general progresiva: Formas cerebelosas de Alzheimer y desmielinizantes. Por el Dr. Ramón Melgar. Paper. Pp. 110, with 55 illustrations. Buenos Aires: Imprenta de Alfredo Frascoll, 1940.

There have been few detailed studies of the histologic changes in the cerebellum as the result of dementia paralytica. The most marked signs of syphilis are not found in this organ but in the cerebral cortex, particularly in the frontotemporal lobes. The present monograph deals with the detailed examination of six brain specimens from cases of dementia paralytica with particular attention paid to the cerebellar findings. No previous publication has given such a detailed account of this particular part of the brain as affected by syphilis. In only one case study, moreover, was previous treatment with malaria used, so that we have reason to believe that the changes observed are actually the result of syphilis. There is nothing characteristic about these changes. The importance of Melgar's monograph lies in the fact that he has carefully studied the cerebellar tissue and has shown changes similar to those which occur in other parts of the brain. The work is lavishly illustrated with photographs of microscopic sections in which the older as well as the most modern methods of staining have been used. This volume is a distinct addition to neuropathology and should become part of the equipment of all neuropathologic laboratories.

Diseases of the Nails. By V. Pardo-Castello, M.D., Assistant Professor of Dermatology and Syphilology, University of Havana, Havana. With a foreword by Howard Fox, M.D., Professor of Dermatology and Syphilology, New York University, New York. Second edition. Cloth. Price, \$3.50. Pp. 193, with 98 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1941.

In this edition Pardo-Castello has followed the same principles that inspired the first edition. Several new illustrations have been added and sixty-five new references to the literature are analyzed. This edition, like the first, is a welcome addition to the monographs dealing with diseases of a special organ. The material is clearly presented in seven chapters dealing with all phases of diseases of the nails and is a clear presentation of each condition with explanation of the complex terminology which is peculiar to disorders of the nails. Etiology and treatment of each condition are discussed and bibliographic references are given. Excellent photographs accompany each entity and help to enhance the clarity of the descriptions of each condition. The book is well presented with clear legible type, and there is a two page table dealing with occupations in which diseases of the nails are common, and a brief elaboration of the unequal symptoms due to poisons. A bibliography with two hundred and eleven references completes the book. The book is recommended to all practitioners interested in diseases of the nails.

Gastric and Duodenal Ulcers. By Harold Avery, D.Sc., M.B., M.R.C.P., Senior Physician, Battersea General Hospital, London. Cloth. Price, 7s. 6d. Pp. 110, with 30 illustrations. London: John Bale & Staples Limited, 1940.

This is a brief review of the subject of gastric and duodenal ulcer and contributes nothing that is new. Pathologic changes and theories of etiology occupy the greater portion of the first half of the book. The discussion is clear and, as the author intends, psychologic factors receive emphasis. The clinical discussion is inadequate. The pressing need of physicians today with regard to ulcer is the establishment of definite criteria for surgical intervention. Such indications cannot be listed in the conventional rote but require a general discussion well interlarded with clinical experience. The author states that gastric resection for duodenal ulcer is followed in many cases by hyperchlorhydria, a statement not borne out by the experience of any large surgical center. In general there is little in this treatise which cannot be found in the standard textbook of medicine.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MARRIAGE IN EPILEPSY

To the Editor:—I am interested in obtaining an answer to the question should the epileptic marry? and references to literature. My patient, a white woman aged 24, a stenographer and accountant, works every day. She is a college graduate and mentally above average. No physical defects can be found, and there is no history of epilepsy in her father's or mother's family. She has five brothers and sisters, three of whom are married and have families, and there is no epilepsy among them. My patient began having nocturnal epilepsy with mild attacks in 1934. She once went one year without an attack; at another time she went six months. The attacks are irregular now and average one attack a month. She thinks the attacks occur at or near the menstrual period. Her menses are normal. The first attack occurred after severe college examinations and a typewriting contest. Treatment has consisted of a careful study and examination, avoidance of all exciting causes, ketogenic diet, salt reduction, dry diet, and phenobarbital $\frac{1}{2}$ grain (0.03 Gm.) at bedtime. The patient has taken thyroid and ovarian substance. I am particularly interested in knowing whether or not this well developed, good appearing, well educated young woman should be advised to marry.

M.D., Utah.

ANSWER.—Epileptic patients may marry and lead a normal conjugal life. However, they should not have progeny regardless of the family history or the physical findings in the individual case. Epilepsy is transmitted through heredity even though the history as given is not positive. Peterman found a family history of epilepsy in about 55 per cent of his cases. He has stated that the disease is transmitted as a mendelian recessive trait. The electroencephalogram has established proof of the inheritance of epilepsy. Patients with symptomatic convulsions, that is, with some organic basis, have three times as many near relatives with epilepsy as do those with some non-convulsive disease. Patients with essential epilepsy have five times as many relatives with epilepsy. In a series of 46 patients electroencephalographic records of both of whose parents were made there was only one instance in which both parents had entirely normal records. At present the only hope of eliminating the disease epilepsy is by birth control among the epileptic adults.

NEURODERMATITIS CIRCUMSCRIPTA

To the Editor:—Would you please inform me as to any new therapy for neurodermatitis circumscripta? I have a patient who is suffering with severe itching from that disease.

M.D., New York.

ANSWER.—There are three recent contributions to the therapy of localized neurodermatitis, or lichen simplex chronicus. B. Pontopiddian (Treatment of Neurodermatitis, Particularly Pruritus Ani) with Subcutaneous-Submucous Injection of Alcohol, *Ugeskr. f. læger* 102:505 [May 16] 1940) advocates alcohol injections according to the method of Stone, proposed in 1916 and since modified by Buie. He used it on inveterate patches about the anus, on the vulva and in the axilla and obtained excellent results, lasting in his first 2 cases eighteen months. The others were treated only a short time ago. He refers to the paper of S. T. Danis (Pruritus Ani, *Canad. M. A. J.* 38:265 [March] 1938), who gives details of technique and the after-treatment, which he says is most important. There is some danger of necrosis of the skin. The patient should remain in the hospital two weeks.

G. V. Kulchar (Elastic Adhesive Dressings in the Treatment of Lichen Simplex Chronicus, *Arch. Dermat. & Syph.* 40:1001 [Dec.] 1939), treating neurodermatitis on the limbs, cleanses the patch thoroughly, paints it with a 5 per cent solution of methylrosaniline and after this is dry applies a spiral bandage of the elastic adhesive, well below and above the area involved, allowing it to remain a week. Then it is removed, keratotic portions are curetted and a new dressing is applied. Three or four treatments are usually enough to cure the dermatitis, but Kulchar wisely advises continuation of the dressing for several weeks longer to prevent rubbing of the clothing. It not only does that but reminds the patient that this is the area that he must not scratch and prevents his scratching during the waking period, before fully conscious.

The third contribution is by W. W. Heyerdale and E. E. Cannon (Neurodermatitis Associated with Incompetent Greater

Saphenous Veins, *Arch. Dermat. & Syph.* 44:52 [July] 1941), who were confronted by a case of many years' duration involving both legs of a housewife 49 years of age. The itching was especially intense at night and before the menstrual periods but had not ameliorated after she passed the menopause. No treatment had had much effect, except that it had once cleared up after ultraviolet irradiation; but repetition of this treatment after the disease recurred did not affect it. Though no varicosities were visible, a careful examination showed dilated greater saphenous veins on both sides, with incompetent valves. A trial dose of sodium morrhuate was given to discover sensitivity if present and, after this was ruled out, the veins were ligated and divided, the distal portions being injected with sodium morrhuate. They became sclerosed, and the dull red bands indicating their course led to the areas of dermatitis. On the fourth postoperative day the itching was lessened and on the tenth day had ceased and the dermatitis had disappeared.

When one can discover such a basic condition and remedy it with good effect on the dermatitis, it is a triumph. Too often, even if the underlying condition is successfully treated, the dermatitis persists. Still more often, no physical basis can be found. There are many methods of attacking the local disease, but the general nervous sensitivity is the important part of the problem. There is danger even of such a localized case becoming generalized. The mental and nervous condition deserves the particular attention of the physician.

PHYSICAL FITNESS OF BOYS FOR COMPETITIVE SPORTS

To the Editor:—A resolution concerning the age limits for boys competing in high school interscholastic athletic contests has been introduced into a certain school board. The object of the rule is to allow only boys between 16 and 18 years of age, inclusive, to take part in interscholastic competition. Younger boys would be allowed to play only on the B team (second team interschool competition). The present rule permits boys of all ages to participate until they reach their twentieth birthday. The people against this rule going into effect are of the opinion that physical maturity cannot be determined by chronological age. They feel that each boy should be handled as an individual, regardless of age limitations. Do you have any findings in support of the contention that chronological age is not sufficient basis for determining physical maturity of "teen" age boys?

J. P. Conway, M.D., Milwaukee.

[This question was referred to two qualified consultants, whose replies follow.—Ed.]

ANSWER.—The determination of physical fitness by age alone seems to be against the experience and judgment of the best authorities in the field of physical education. It is true that at the age of 17, on the average, boys have reached the mechanical efficiency for moderate work which is characteristic of the adult (Robinson, Sid: *Experimental Studies of Physical Fitness in Relation to Age, Arbcitsphysiol.* 10:251 [No. 3] 1938). F. J. Lipovetz (Applied Physiology of Exercise, Minneapolis, Burgess Publishing Company, 1938) has studied endurance, strength, skill and efficiency records of American youths from the age of 12 years to adult life. His records also show that adult types of response to exercise are reached at about the seventeenth year. All workers deal with averages, which is sufficient evidence that some boys reach a condition of physical fitness suitable for participation in athletics at one time and others at some other time. The exact period seems to fluctuate around the seventeenth year. This information on age is extremely useful, but it cannot settle any individual problem. Only a complete physical examination and tests for physical efficiency could give an answer fitting the particular individual. At present unfortunately, tests for either physical fitness or athletic efficiency are not entirely satisfactory and the best of them can be applied only at well equipped laboratories. Practically the best thing seems to be to let an experienced physician, preferably one who has had athletic experience, pass judgment on the candidate's physical fitness after a thorough examination. This has the further obvious advantage of uncovering hidden defects which could not be detected by any age standard.

ANSWER.—The contention that physical maturity cannot be determined by chronological age has sound physiologic support. Maturation in the sexual meaning of the word is a well defined phenomenon, and the extent to which its occurrence varies among individuals and among races is well known. It is also clear that maturation in the sense of attainment of full physical power does not necessarily run parallel to sexual development; it is a process that depends not merely on inherent make up but also on training, on diet and on the economic level.

The best quantitative physiologic measurements of the variability in physical capacity among boys and men are those of Robinson. He shows, for example, that the capacity for supplying oxygen to tissues in strenuous exertion tends toward a

maximum at about age 18 and thereafter declines. However, many boys of 10 years of age can better the performance of others ranging from 14 to 19 years. This measurement, expressed as cubic centimeters of oxygen per kilogram of body weight, may be taken as a functional test of the respiratory-circulatory system. While the capacity of this system in relation to the size of the body tends to increase during the teens, many individuals are far out of line with this trend.

Other evidence could be marshaled, but it is believed that that cited is sufficient defense for the idea that "each boy should be handled as an individual."

LATE EFFECTS OF ROENTGEN THERAPY IN SINUSITIS

To the Editor:—What are the effects of high voltage roentgen therapy in sinus disease five to ten years after treatment has been applied? I have been searching for such information without results. Kindly inform me who has kept such records.

Joseph Harold Friedman, M.D., New York.

ANSWER.—A search of the literature reveals little information that would make a satisfactory answer to the query. One good contribution (Butler, F. E., and Woolley, I. M.: Roentgen Treatment of Chronic Sinusitis, *Radiology* 30:686 [June] 1938) refers to seven years' experience, another to three years' experience. Few of the others state time intervals. In those that do, only general statements are made and there are practically no series of case reports indicating intensive and acceptable follow-up methods.

Furthermore, before this question can be answered there must be agreement as to what constitutes sinusitis, acute, chronic and allergic. There must also be agreement as to what evidence is acceptable as reasonably proving that a cure has taken place. This evidence must conform to the best rhinologic standards and must not consist alone of roentgenologic evidence and patients' claims to improvement. Here is where the difficulty in adequately proving a cure will arise. There are few patients cured or even temporarily improved who will permit proof irrigations or removal of tissue for microscopic study, and still such procedures are often necessary to demonstrate improvement. It must not be forgotten that the patient with acute sinusitis frequently gets well spontaneously.

With all this in mind, a review of the literature of the last few years yields little that will satisfy this query. Many proponents of roentgen treatment appear to err on the side of enthusiasm, and there are not many of the few case reports that are cited which would satisfy the best rhinologic standards or which cover the periods of years mentioned.

E. T. Gatewood (Of What Value Is Roentgen Therapy for Sinusitis, *Arch. Otolaryng.* 31:275 [Feb.] 1940) reviews the literature and discusses 22 cases in which careful examination was made before and after treatment. This article makes no exaggerated claims and will probably answer many of the questions that the query implies, but it does not definitely cover the five to ten year period mentioned.

SURGERY DURING MENSTRUATION

To the Editor:—Is it unwise to do elective surgery while the patient is menstruating? It has been stated that gynecologic procedures and tonsillectomies are especially contraindicated, the former because of pelvic hyperemia, the latter because bleeding is more prolonged and difficult to control. I would appreciate your opinion on this statement.

M.D., British Columbia.

ANSWER.—The recorded evidence, from laboratory tests, as to the nature and extent of systemic changes during menstruation is contradictory. There seems to be general agreement on the following points: Menstruation has been associated with critical periods in a significant number of patients suffering from tuberculosis, epilepsy, diseases of the eye and skin, mental disorders and possibly granulocytopenia. There is generally an increase in the sedimentation rate at this time. According to W. F. Peterson, postoperative emboli are slightly more frequent in women operated on during menstruation.

The literature reveals no constant variation in the blood picture, basal metabolism or blood chemistry. It is possible that capillary resistance is decreased.

Because of variable increased vascularity and the possibility of endometrial transplants via the oviducts, most surgeons avoid pelvic procedures at this time. However, menstruation is considered no deterrent to emergency gynecologic surgery.

The opinion of most surgeons is well summarized in Lewis's Surgery: "Although we have operated upon women during menstruation and do not feel that the wounds are more vas-

cular nor that the postoperative course is more complicated, in view of the general dread which most women have of an operation at this time of the month, we do not make it a general practice."

"Women like to feel at their best before an operation," says another practical surgeon (Harvey).

MASKS FOR PROTECTION FROM CARBON TETRACHLORIDE

To the Editor:—Can you tell me if a mask for the protection against the fumes of carbon tetrachloride is made and where one can be obtained? I have two patients who have a toxic gastritis from inhalation of these fumes while cleaning out the distilling tank of a dry cleaning establishment.

Carl W. Hammer, M.D., Oxford, Mich.

ANSWER.—The Mines Safety Appliances Chemical Cartridge Respirator with G. M. A. cartridges should give adequate protection against carbon tetrachloride vapors as encountered in cleaning out distilling tanks in dry cleaning establishments. In tests which have been made, concentrations above 2,000 parts per million were not found and the average concentrations during the cleaning of such tanks were considerably below 1,000 parts per million. The cleaning period was less than a half hour. The standard test of the respirator mentioned shows that it protects against 1,000 parts per million of carbon tetrachloride when aspirated at the rate of 32 liters per minute (which is approximately two and one-half times the normal rate of respiration) for thirty-five minutes. If a much longer exposure period is necessary, a Burrell industrial gas mask with G. M. A. canister would be preferable, although it is more cumbersome. In either instance, supplied directions as to changing of cartridge or canister after exposure should be carefully followed. These respirators are supplied by the Mines Safety Appliances Company, Pittsburgh, and are certified by the U. S. Bureau of Mines Laboratories.

SIGNS OF ANESTHESIA

To the Editor:—I have noted in administering pentothal sodium that the crease or wrinkle on the upper eyelid at the upper edge of the tarsal plate and parallel to it becomes smoothed out and generally disappears soon after the patient becomes insensitive to pain. When the line reappears, more pentothal is needed at once or the patient is soon moving on the table. As this line smooths out, the entire lid is smoother and seems flatter. Has this sign been described in medical literature?

H. R. Meyer, M.D., Lansing, Mich.

ANSWER.—During the induction of intravenous anesthesia before muscular relaxation has taken place there may be many evidences of tension about the facial muscles such as squinting or other such contractions about the eyes, forehead and mouth. As the anesthesia deepens and muscular relaxation sets in, these lines tend to become obliterated. The crease or wrinkle on the upper eyelid would fall into this group and would become obliterated as the anesthesia reached sufficient depth. There would also reappear certain other lines about the face as the anesthesia became lighter and muscular tone increased. These signs have not appeared to be of 100 per cent prognostic value as to the deepening or lightening of anesthesia. This may be illustrated by the fact that masseter relaxation is a reliable sign that anesthesia is of adequate depth but in many instances painful stimuli have been elicited in the presence of relaxation of the jaw. The information gained by the several signs of anesthesia, that is, degree of respiratory depression, eye, pupillary and lid reflexes, and muscular relaxation appear to constitute a more reliable guide to the depth of anesthesia than any single sign.

PARADOXIC PUPIL REACTION IN EARLY MENINGITIS

To the Editor:—Will you please inform me as to the mechanism involved in the first stage of severe cerebrospinal meningitis, when no other symptoms but high fever and severe headache are present, without stiffness in the body. The pupils dilate to light in some cases and contract almost to a pinpoint when light is excluded.

J. Louis Waldner, M.D., Loveland, Colo.

ANSWER.—The portal of entry of the infection in cerebrospinal meningitis is the lymphatics draining the tonsils and the adjacent lymphatic tissues. From them the infection travels by way of the blood stream to the subarachnoid space. Early in the course of the infection only the signs of generalized meningococcemia are found. These include fever, headache, chills, and generalized hyperesthesia. It is only after localization in the leptomeninges that cervical rigidity develops. The latter symptom may not present itself until the third or fourth

day after onset of the illness. The pupillary behavior in this disease may be extremely variable. The type of pupil described is known as the paradoxical pupil reaction. The explanation of this reaction is not definitely known. It has been ascribed as an illusion, there being either a secondary dilatation which was preceded by a transient and unnoticed contraction or a pupil insensible to light which is dilated because at the moment of illumination the eyeballs were passing into the position of divergence. Another cause has been the stimulation of heat or the fact that strong sensory stimulations cause a dilatation of the pupils (Oppenheim). The third reason may be a depressed sphincter or an overstimulated sympathetic reaction.

CHILDBIRTH AFTER AMPUTATION OF CERVIX

To the Editor:—A woman aged 42 had an amputation of the cervix one year ago. Now she is three months gravid and in fairly good general health although she has a compensated mitral stenosis. Would you permit spontaneous delivery or is a cesarean operation indicated? What complications may be expected in such a delivery from below?

M.D., New York.

ANSWER:—The high amputation of the cervix is occasionally followed by the premature interruption of pregnancy. Most cervical amputations produce no unusual difficulties in a subsequent labor. The cervix dilates readily and the labor is uneventful. Occasionally, however, the cervix fails to dilate because of scar tissue, and little progress is made after many hours of pains. In such instances abdominal delivery may be indicated. The patient can be given a test of labor of twelve or fifteen hours, at the end of which time a pelvic examination should be done to determine the progress. If the cervix dilates readily during this test of labor or if the examination reveals that the cervix offers no obstacles, delivery can be completed through the natural passages. In the event that the labor has made no impression on the cervix or if on examination it is found to be hard and rigid, then cesarean section can be carried out. According to experience in one hospital it has been necessary to perform a cesarean section in only one instance in over 25,000 deliveries because of serious cervical dystocia as a result of a high amputation of the cervix.

STERILIZING OILY MEDIUMS

To the Editor:—Could you supply me with any information concerning the procedure necessary to remove the oily content in sterilizers? In my practice I use a large amount of endocrine products, which are put up in oily bases, and I have been able to find no satisfactory method of reducing the oily content of the water in my sterilizer.

C. J. Toohey, M.D., Anchorage, Alaska.

ANSWER:—The inside walls of the sterilizer should be rubbed well with trisodium phosphate or a mildly abrasive scouring powder, followed by thorough rinsing. The pipes, if they contain oil, may be flushed clean with strong hot sodium carbonate solution and then with an abundance of clean hot water.

The condition is best avoided, however. With proper use of the apparatus it is possible to autoclave nonvolatile oils, such as are usually employed for endocrine products, without letting them escape from their containers. Nevertheless, it is not a procedure to be recommended. Autoclaving is an inferior and unreliable method of sterilizing oil or products put up in oil bases. Spore forming organisms in an anhydrous medium, whether oil or dry air, are not certainly killed by temperatures up to 121 C. (15 pounds pressure) even in forty-five minutes. Moreover, endocrine products are likely to be thermolabile. A preferable method is to sterilize the oil base separately in a dry heat oven (at 150 C. for one hour) and then, with aseptic technic, using sterile instruments and utensils, to add the drug to the oil.

PILONIDAL CYST

To the Editor:—A man was operated on in June 1936 for a pilonidal cyst. Six months elapsed before the wound was completely healed. In June 1940 the sinus reopened and has been discharging almost continually. He has been treated by another doctor and apparently the treatment consisted of antiseptic solution of one type or another. The questions are: 1. Is there any new treatment for pilonidal cysts other than surgical? 2. What are the possibilities of sulfanilamide locally, i. e. solution of the powder? If so, what would be the best solution to use? 3. What is the present status of the Lahey operation for pilonidal cysts?

H. C. Schurman, M.D., Caldwell, N. J.

ANSWER:—The condition described may well represent a recurrence of the pilonidal cyst.

1. Small recurrences which can be easily reached are sometimes treated by the silver nitrate stick. This will occasionally work. The treatment is painful.
2. Various antiseptic solutions seem to have little effect on these cysts.

3. Bloc excision of the cyst and surrounding tissues without entering the cyst is the object of almost all operations on pilonidal cysts. The Lahey operation offers the advantage of transplanting a strip of skin and fat over the sacrum. It has some advantages and works well in perfectly clean cases. If one is in doubt as to contamination, it is better to do a simple excision.

CANDY, CARIES AND DELAYED ERUPTION OF TEETH

To the Editor:—What is the latest information regarding the influence of candy and other sweets on the teeth of children. Can candy be the cause of caries, and, if so, why more so than the use of sugar on cereals or other foods? In the presence of an otherwise well balanced diet and proper vitamin intake, could the use of sugars have any influence on the delayed eruption of the permanent teeth?

J. G. Roberts, M.D., Pomona, Calif.

ANSWER:—According to present knowledge, candy and other carbohydrates are conducive to caries, the more freely fermentable ones being more detrimental. The effect of the carbohydrates is purely local on the enamel surface and promotes bacterial activity leading to caries. Candy is more "caries promoting" than the sugar used on cereals since it contains much more carbohydrates and remains in the oral cavity for a longer time.

There appears to be no clinical evidence or experimental basis for any influence of sugars on the eruption of the deciduous or permanent teeth.

VICARIOUS APPETITE

To the Editor:—Information is desired concerning the probable cause and suggested treatment of a case of vicarious appetite occurring in a girl college student aged 20 years. She appears to be perfectly normal, physically and mentally, except for the insatiable desire to eat lead pencils. She states that she has done this since childhood and cannot resist the temptation longer than two or three days at a time. When the desire strikes her, she will purchase a half dozen penny pencils, chew them well and swallow them, except for the lead. This habit apparently produces no symptoms except for transient abdominal discomfort shortly after ingestion. Any information that you may be able to give me on this subject will be appreciated.

M.D., New Jersey.

ANSWER:—The patient apparently has a neurosis accompanied by compulsive behavior. The eating of pencils is probably the most spectacular symptom of the neurosis but it undoubtedly is not the only one. This is clearly a psychiatric problem. Treatment in such cases is highly individual, and its success depends to a large extent on the ability to elicit the underlying causative factors of the neurosis. A competent psychiatrist is best qualified to handle such a case.

METHYLENE BLUE IN PLASMA FOR TRANSFUSION NOT INDICATED

To the Editor:—Methylene blue is a strong hydrogen receptor and is given in cases of carbon monoxide poisoning as a substitute for hemoglobin. Would it be advantageous to add methylene blue to blood plasma which is to be given in cases of shock with blood loss in order to counteract both the anoxemia and protein loss? If this is a correct assumption, what should be the methylene blue concentration in the plasma?

Arnold F. Strauss, M.D., Norfolk, Va.

ANSWER:—The addition of methylene blue to blood plasma to be used in cases of shock with blood loss would not increase the tendency to correct either anoxemia or protein loss.

UNDULANT FEVER

To the Editor:—In the August 23 issue of The Journal, under Queries and Minor Notes, is a question headed "Undulant Fever or Other Gastrointestinal Disease," in which several points deserve clarification. Undulant fever does not imply fever, as pointed out in your reply. However, in the chronic stage of the illness only slight elevations of temperature or no fever are commonly noted. The chronic illness is by far more common than the acute, although it often is unrecognized. Because of the lack of fever in the chronic illness, the term brucellosis seems preferable and is being widely adopted. It is not unusual for a patient to have a single febrile episode and then to suffer from a variety of conditions referable to a episode and then to suffer from a variety of conditions referable to a chronic afebrile infection. In fact, this sequence is frequently encountered and usually is unrecognized, the clinician feeling satisfied that the patient, once free of fever, has recovered completely. There is no typical blood picture in brucellosis. Leukopenia is thought to exist in the great majority of cases. However, the observations of Calder, my own and others have shown that leukocytosis, leukopenia or a normal total white count may be found with about the same frequency. Relative lymphocytosis is common, however. The treatment of brucellosis, in the chronic phase, seems best accomplished by the use of a heat killed Brucella abortus vaccine, rather than a mixed vaccine or filtrate, in any dilution that is found necessary to avoid severe local or general reactions.

Harold J. Harris, M.D., Brooklyn.

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THE ADRENAL HORMONES IN MEDICAL PRACTICE

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COLUMBUS, OHIO

Not only are adrenal preparations widely used in the treatment of Addison's disease but workers are finding application for their use in other clinical conditions. Unfractionated extract from which the epinephrine has been removed possesses the advantage that the hormones exist in as nearly a natural state as it is possible to obtain them. Fractionation modifies some of the hormones and may decrease their potency. The crystalline products probably are not the original hormones but are more stable forms derived from them. Desoxycorticosterone, the only compound that has been synthesized, represents only one substance from the adrenal which can cause sodium retention. Sodium factor is another.

Although the number and nature of the original hormones are not clear, their functions are beginning to be understood. A knowledge of the latter is necessary for rational therapy.

FUNCTIONS

Permeability.—The adrenal plays an important part in the regulation of membrane permeability. Winter and I¹ showed that skeletal muscle from adrenalectomized rats shifted its water more readily in either direction than did muscle from normal animals. Water entered more rapidly from hypotonic solution and left more rapidly in hypertonic solution. Hegnauer and Robinson² found that both skeletal muscle and erythrocytes in adrenalectomized animals absorbed water. Harrop³ observed that water was absorbed by the cells from the interstitial fluid after adrenalectomy. The negative results of Ponder and Gaunt⁴ on modified permeability in the adrenalectomized rat might be explained by the fact that the muscles of their animals already contained a greater percentage of water than did those of the controls. The Angerer⁵ have shown that adrenalectomized frogs take up abnormal amounts

of water and that the skeletal muscle, because it holds an excess of water, imbibes less water from a hypotonic solution than does normal muscle.

The blood capillary walls share in this increased permeability so that the blood volume decreases (Athanasius and Gradinesco⁶) and blood pressure falls for this and other reasons. The loss of blood volume is due not so much to a negative water balance in the body as it is to a redistribution of water. Administration of adrenal extract without extra fluid will restore the normal plasma volume and blood pressure (Swingle and his associates⁷).

Electrolyte Metabolism.—Further evidence of a general cellular disturbance is found in the electrolyte changes which occur. This is not limited to excessive loss of sodium and retention of potassium by the kidney. The increase of potassium in erythrocytes and in skeletal muscle cells and the shift of potassium from the liver and heart indicate a fundamental change in cell metabolism. Administration of adrenal extract to adrenalectomized animals reestablishes normal potassium relations. Indeed such an extract influences normal animals, depressing the usual release of potassium from skeletal muscle which occurs during stimulation (Tipton⁸).

General Metabolism.—Evidence is conflicting as to whether or not the basal metabolic rate of patients suffering from Addison's disease is subnormal (Greene, Rowntree, Swingle and Piffner;⁹ Marañón, Calvo Pena and Ossorio Florit¹⁰). In adrenalectomized animals the fall averages 25 per cent of the total metabolism (Marine and Baumann;¹¹ Aub, Forman and Bright¹²). Any treatment (unfractionated extract, cortin fraction, sodium factor, desoxycorticosterone or sodium salts [Brownell and Hartman¹³]) which main-

6. Athanasius, C., and Gradinesco, A.: The Adrenal Capsules and the Interchange Between Blood and Tissues, *Compt. rend. Acad. d. sc.* **149**: 413, 1909

7. Swingle, W. W.; Parkins, W. M.; Taylor, A. R., and Hays, H. W.: Relation of Serum Sodium and Chloride Levels to Alterations of Body Water in the Intact and Adrenalectomized Dog, and the Influence of Adrenal Cortical Hormone upon Fluid Distribution, *Am. J. Physiol.* **116**: 438-445 (July) 1936.

8. Tipton, S. R.: The Effect of Cortin on the Electrolyte Changes in Cat Muscle During Stimulation and Recovery, *Am. J. Physiol.* **124**: 322-327 (Nov.) 1938

9. Greene, C. H.; Rowntree, L. G.; Swingle, W. W., and Piffner, J. J.: Metabolic Studies in Addison's Disease. The Effect of Treatment with Cortical Hormone of the Suprarenal Gland, *Am. J. M. Sc.* **123**: 1-23 (Jan.) 1932

10. Marañón, G.; Calvo Pena, L., and Ossorio Florit, E.: Basal Metabolism in Chronic Adrenal Insufficiency: Action of Adrenal Hormones (Cortical and Medullary) on Metabolism, *Ann. de med.* **37**: 168-181 (Feb.) 1935.

11. Marine, David, and Baumann, E. J.: The Influence of Glands with Internal Secretions on the Respiratory Exchange: VI. Further Data on the Effect of Suprarenal Insufficiency (by Removal) in Rabbits, *J. Metab. Research* **2**: 1-18 (July) 1922

12. Aub, J. C., Forman, J., and Bright, E. M.: The Effect of Adrenalectomy upon the Total Metabolism of the Cat, *Am. J. Physiol.* **61**: 326-368 (July) 1922.

13. Brownell, K. A., and Hartman, F. A.: The Influence of Adrenal Preparations on Basal Metabolism and the Specific Dynamic Action of the Three Major Food Stuffs, to be published.

From the Department of Physiology, Ohio State University.
Read before the Section on Pathology and Physiology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1. Winter, C. A., and Hartman, F. A.: Water Shift in the Muscle of Adrenalectomized Rats, *Proc. Soc. Exper. Biol. & Med.* **31**: 201-203 (Nov.) 1933.

2. Hegnauer, A. H., and Robinson, E. J.: The Water and Electrolyte Distribution Among Plasma, Red Blood Cells and Muscle After Adrenalectomy, *J. Biol. Chem.* **116**: 769-778 (Dec.) 1936.

3. Harrop, G. A.: The Influence of the Adrenal Cortex upon the Distribution of Body Water, *Bull. Johns Hopkins Hosp.* **59**: 11-24 (July) 1936.

4. Ponder, E., and Gaunt, R.: Swelling of the Muscles of Adrenal-ectomized Rats, *Proc. Soc. Exper. Biol. & Med.* **32**: 202-204 (Oct.) 1934.

5. Angerer, C. A., and Angerer, H.: Weight Variations of Muscles of Adrenalectomized Frogs in Normal and Hypotonic Ringer's Solutions, *Am. J. Physiol.* **133**: 197-198 (June) 1941.

tains a good clinical condition also maintains basal metabolism at the normal level. Overdosage apparently does not raise the metabolism further.

The metabolic disturbances which are present in adrenal insufficiency might be due to changes in the circulatory or nervous system. A recent study of isolated tissues shows that these factors are not solely responsible. In a late stage of insufficiency the metabolism of kidney (Crismon and Field¹⁴) and liver slices (Tipton¹⁵) is decreased as much as 25 per cent. Reduction in enzyme activity may be a factor. The deamination of amino acids by kidney tissue is reduced (Jiménez-Díaz¹⁶). This can be returned to normal or above by adrenal extract or by desoxycorticosterone in large amounts (Russell and Wilhelmi¹⁷). The rate of oxidation of pyruvate, succinate and citrate by the kidney is also decreased after adrenalectomy.¹⁷ This was shown by Tipton¹⁵ to be true for the liver.

Carbohydrate Metabolism.—Of the various foodstuffs, our present knowledge indicates that carbohydrate is most affected in adrenal insufficiency. Carbohydrate absorption is reduced (Cori and Cori¹⁸). This reduction, coupled with a possible increased utilization, may account for the flattened dextrose tolerance curve found in patients with Addison's disease (Thorn, Koepf, Lewis and Olsen¹⁹). The ability to form carbohydrate from noncarbohydrate sources is diminished or abolished. Thus relatively short starvation lowers the liver glycogen. On the other hand, large doses of adrenal extract, corticosterone, dehydrocorticosterone or Kendall's compound E can raise the liver glycogen considerably above the normal level (Long, Katzin and Fry²⁰). The decreased fasting blood sugar observed by many workers, notably Britton and Silvette,²¹ may be accounted for by increased utilization and diminished glycconeogenesis.

The metabolism or rate of energy liberation of the cell may well be the determining factor in the permeability characteristic of the membrane. Small permeability effects in each cell make a large total when all cells are considered.

The action of the adrenal cortex is not restricted to a single tissue. Indeed it is quite possible that all tissues are involved in varying degrees. The failure of the kidney to reabsorb sodium may be associated with its reduced metabolic activity. The whole question of carbohydrate storage, glycconeogenesis and carbohydrate and fat oxidation may be concerned with metabolic disturbances of the liver.

Much of the changed metabolism is merely a reduction in the rate of normal processes. It may become serious only when continued over a long period or when stress creates an unusual demand.

Relation to Vitamins.—The effect of the adrenal on other metabolic processes is shown in deficiencies of vitamin B₁ and C. Injection of an extract free from these vitamins retards the onset of symptoms of avitaminosis. However, it does so only while some vitamin is present (Lockwood and Hartman;²² Lockwood, Swan and Hartman²³). It might be due to a protection of the vitamin against destruction.

Pigmentation.—The pigmentation of Addison's disease may be the result of a disturbance in enzyme action. It is unaccounted for by the absence of any known adrenal factor. It is probably specific because it has been known to be present for fourteen years before the onset of serious symptoms. Moreover, it is peculiar to man, as no bona fide instances of pigmentation have been discovered in adrenalectomized animals. Treatment with adrenal extract in some cases caused disappearance of the pigmentation.

Lactation.—Cortilactin, a factor described some years ago by Brownell and his associates,²⁴ has recently been prepared in our laboratory by isoelectric precipitation. It affects the metabolism of the lactating rat. When supplemented by other fractions of the adrenal, it enables an adrenalectomized rat to raise 100 per cent of her pups with growth curves in the normal range. Cortilactin has no effect on glycconeogenesis.

Relation to the Nervous System.—It has been known since the time of Addison that the nervous system is affected by adrenal insufficiency. That these effects may be primary is indicated by the psychoneural disturbances which may appear in Addison's disease before other changes are manifested. These consist of mental fatigue, insomnia, restlessness and abnormal reactions in the sensory apparatus.

Adrenal cortex extract has been shown objectively by experiments of Liddell and his associates²⁵ on sheep to influence the nervous system. A neurosis was produced by a conditioned motor reflex. This was characterized by extreme excitement, uncooperative behavior and spontaneous, nervous twitching movements. The extract after a few injections quieted the animal, increased the vigor of the conditioned reaction and decreased the frequency of the nervous movements. The effects persisted for more than twenty-four days after the last injection.

Hitchcock, Grubbs and I²⁶ found that adrenal cortex extract reduced oxygen consumption in normal human beings undertaking moderate exercise. This was confirmed by Missiuro, Dill and Edwards.²⁷ The effect persisted for a few weeks after the extract had been discontinued. This reminds one of the after-effects on sheep and suggests action through the nervous system.

The adrenal, through its influence on metabolism, permeability and enzyme action, and probably by its effect on the nervous system, plays a dominant role

14. Crismon, J. M., and Field, J. H.: The Oxygen Consumption in Vitro of Brain Cortex, Kidney and Skeletal Muscle from Adrenalectomized Rats, *Am. J. Physiol.* **130**: 231-238 (Aug.) 1940.

15. Tipton, S. R.: The Respiration of Isolated Liver and Kidney Tissues from Adrenalectomized Rats, *Am. J. Physiol.* **132**: 74-80 (Feb.) 1941.

16. Jiménez-Díaz, C.: Death in Addison's Disease, *Lancet* **2**: 1135-1139 (Nov. 14) 1936.

17. Russell, J. A., and Wilhelmi, A. E.: Metabolism of Kidney Tissue in the Adrenalectomized Rat, *J. Biol. Chem.* **137**: 713-725 (Feb.) 1941.

18. Cori, C. F., and Cori, G. T.: Fate of Sugar in Animal Body. The Carbohydrate Metabolism of Adrenalectomized Rats and Mice, *J. Biol. Chem.* **74**: 473-494 (Sept.) 1927.

19. Thorn, G. W.; Koepf, G. F., Lewis, R. A., and Olsen, E. F.: Carbohydrate Metabolism in Addison's Disease, *J. Clin. Investigation* **19**: 813-832 (Nov.) 1940.

20. Long, C. N. H.; Katzin, B., and Fry, E. G.: The Adrenal Cortex and Carbohydrate Metabolism, *Endocrinology* **26**: 309-344 (Feb.) 1940.

21. Britton, S. W., and Silvette, H.: The Apparent Prepotent Function of the Adrenal Glands, *Am. J. Physiol.* **100**: 701-713 (May) 1932.

22. Lockwood, J. E., and Hartman, F. A.: Relation of the Adrenal Cortex to Vitamins A, B₁ and C, *Endocrinology* **17**: 501-521 (Sept.) 1933.

23. Lockwood, J. E., Swan, D. R., and Hartman, F. A.: A Further Study of the Relation of the Adrenal Cortex to Vitamin C, *Am. J. Physiol.* **117**: 553-558 (Nov.) 1936.

24. Brownell, K. A., Lockwood, J. E., and Hartman, F. A.: A Lactation Hormone of the Adrenal Cortex, *Proc. Soc. Exper. Biol. & Med.* **30**: 783-784 (March) 1933.

25. Liddell, H. S.; Anderson, O. D.; Kotyuka, E., and Hartman, F. A.: Effect of Extract of Adrenal Cortex on Experimental Neurosis in Sheep, *Arch. Neurol. & Psychiat.* **34**: 973-993 (Nov.) 1935.

26. Hitchcock, F. A.; Grubbs, R. C., and Hartman, F. A.: The Effect of Adrenal Cortex Extract upon the Oxygen Consumption of Normal Human Beings, *Am. J. Physiol.* **121**: 542-548 (Feb.) 1938.

27. Missiuro, V.; Dill, D. B., and Edwards, H. T.: The Effects of Adrenal Cortex Extract in Rest and Work, *Am. J. Physiol.* **121**: 554-559 (Feb.) 1938.

in the whole organism. It is obvious that treatment of adrenal insufficiency by a single fraction or crystalline compound cannot be sufficient when more than one hormone is involved.

TREATMENT

Addison's Disease.—The treatment of Addison's disease should proceed along three lines: First and most important, the missing hormones should be replaced. Nothing can adequately act as a substitute. Second, the administration of sodium salts and fluid to replace losses incurred from the missing sodium factor will not only facilitate recovery but will reduce the amount of extract required. Likewise the administration of dextrose, especially during a crisis, tends to correct the hypoglycemia that is sometimes present in the late stages. Third, prevention of unnecessary stress reduces the hormone needed and hastens recovery.

Often the patient with Addison's disease is first seen by the physician at or near a crisis. Therefore, one should begin at that stage.

The patient should be treated as in shock, being kept warm with artificial heat if necessary and given intravenous injections of physiologic solution of sodium chloride and dextrose solution together with large amounts of adrenal cortex extract. Intravenous injection of the extract should not be continued because repeated intravenous injections render the patient refractory to the sodium factor.²⁸ All but very limited physical examination and questioning should be avoided until the patient has recovered, because any additional stress may cause death. It is best to withdraw very little blood before the patient shows improvement. Intravenous treatment should be repeated in a few hours if the patient does not show improvement. In any event, subcutaneous injections of extract should be instituted and continued every two or three hours for the first day, after which the interval can be gradually increased until, with complete recovery, the daily extract should be divided into two, or better three, doses. Apparently the extract is readily destroyed or excreted. As soon as food and liquids are tolerated, the patient should be encouraged to eat and drink to replenish the water and salt which have been lost through the kidneys. Sodium salts in the form of chloride, bicarbonate or citrate should be given by mouth. The optimum amount must be determined by trial.

Some patients with Addison's disease are maintained very well by sodium chloride alone; others are not. This may indicate insufficiency of the sodium factor alone. Loeb²⁹ described a patient so maintained. Many patients are helped by sodium salts but need adrenal cortex extract as well. A few patients show no improvement with these salts. Occasionally the stomach does not tolerate them.

Restriction of potassium in the diet may be helpful. Wilder and his associates³⁰ found that the amount of potassium (4 Gm. daily) contained in a normal diet may be sufficient to precipitate a crisis, owing to the increased loss of sodium. Preparation of the diet

is laborious. Sustained cooperation of the patient because of the unpalatableness of the diet is also a drawback.

As the patient improves he may be permitted to take up his normal activities gradually, but treatment must be continued and stresses avoided. With the slightest return of symptoms, the extract must be increased until they disappear, after which a lower dosage can be resumed. The optimum dosage for each patient must be determined by trial. Many patients are given too little extract for maintenance and therefore easily succumb to an infection or unusual stress. It must not be forgotten that crises may appear with little or no warning and that each crisis tends to make the patient more difficult to treat.

Desoxycorticosterone acetate has been used with considerable success in the treatment of Addison's disease. Levy Simpson³¹ reported beneficial effects while Thorn,³² by the method of implantation, not only had striking success but avoided daily treatment. Dryerre,³³ however, found that injection gave a more profound effect than did implantation. Owing to the variation in the amount of material liberated, the pellet method of administering desoxycorticosterone acetate is less satisfactory and more dangerous than the injection method (Soffer, Engel and Oppenheimer³⁴). Recently³⁵ it has been shown that desoxycorticosterone is effective when placed under the tongue in oil. A high sodium, low potassium diet should not be used as desoxycorticosterone causes considerable retention of sodium together with excretion of potassium.³⁶ One must avoid overdosage because it leads to hydremia. This may cause death from cardiac failure.³⁷

Adequate carbohydrate must be fed whether desoxycorticosterone or adrenal cortex extract is used. The former does not support glycogenesis while the latter does not furnish enough carbohydrate factor unless a large amount of the extract is used. Desoxycorticosterone does not protect against some forms of stress.

Other Clinical Conditions.—There are undoubtedly many other clinical conditions in which adrenal insufficiency exists. Stresses increase the hormone requirement because, if the dosage is not raised above the maintenance level when patients with Addison's disease or adrenalectomized animals are placed under a strain, insufficiency develops. The histologic changes sometimes found in the adrenals also indicate that an individual is not always able to meet these requirements.

Stresses which increase the requirements of adrenal hormones are infections, toxins, shock, trauma, heat, cold and exercise. Many claims of a beneficial effect of adrenal cortex extract in a wide variety of ailments have been advanced. Despite justified skepticism, there is evidently a good basis for some.

31. Levy Simpson, S.: Use of Synthetic Desoxycorticosterone Acetate in Addison's Disease, *Lancet* 2: 557-558 (Sept. 3) 1938.

32. Thorn, G. W.: Treatment of Addison's Disease, *J. Clin. Endocrinol.* 1: 76-86 (Jan.) 1941.

33. Dryerre, H. W.: Effect of Desoxycorticosterone Acetate and Cortin on Salt Elimination in Addison's Disease, *Brit. M. J.* 1: 971-973 (May 13) 1939.

34. Soffer, L. J.; Engel, F. L. and Oppenheimer, R. S.: Treatment of Addison's Disease with Desoxycorticosterone Acetate, *J. A. M. A.* 115: 1869-1866 (Nov. 30) 1940.

35. Anderson, Evelyn; Haymaker, Webb, and Henderson, Edward: Successful Sublingual Therapy in Addison's Disease, *J. A. M. A.* 115: 2167-2168 (Dec. 21) 1940.

36. Ferrebee, J. W.; Ragan, C.; Atchley, D. W., and Loeb, R. F.: Desoxycorticosterone Esters: Certain Effects in the Treatment of Addison's Disease, *J. A. M. A.* 113: 1725-1731 (Nov. 4) 1939.

37. Thompson, W. O.; Thompson, Phebe K.; Taylor, S. G., III, and Hoffman, W. S.: Treatment of Addison's Disease with Desoxycorticosterone Acetate, *J. A. M. A.* 114: 658 (Feb. 24) 1940. *Relief not?*

28. Hartman, F. A.; Lewis, L. A., and McConnell K. P.: The Refractory State Produced by Adrenal Extract, *Endocrinology* 24: 197-201 (Feb.) 1939.

29. Loeb, R. F.: Effect of Sodium Chloride in Treatment of a Patient with Addison's Disease, *Proc. Soc. Exper. Biol. & Med.* 30: 808-812 (March) 1933.

30. Wilder, R. M.; Kendall, E. C.; Snell, A. M.; Kepler, E. J.; Rynearson, E. H., and Adams, Mildred: Intake of Potassium, an Important Consideration in Addison's Disease—A Metabolic Study, *Arch. Int. Med.* 59: 367-393 (March) 1937.

Reports of a beneficial effect of adrenal cortex extract on patients with an active infection must be received with considerable reservation.

The asthenia that may develop after the infection disappears is another matter. A good example is a case of streptococcic sore throat reported by Robbins.³⁸ The patient developed extreme weakness and a blood pressure of 55 mm. of mercury systolic and 35 mm. of mercury diastolic after the infection had disappeared. She was difficult to rouse and there appeared to be little hope of recovery. Within twelve hours after the injection of the extract her blood pressure had become 110 mm. of mercury systolic and 70 mm. of mercury diastolic and her appetite for food and drink returned.

There are undoubtedly cases of acute adrenal insufficiency which go unrecognized. In asthenia which cannot be attributed to any other cause this possibility should always be considered.

Adrenal preparations have sometimes appeared beneficial in certain cutaneous disturbances.

In cases of pemphigus abnormal concentrations of electrolytes in the serum were found to be similar to the values found in adrenal insufficiency. Two of three postmortem examinations revealed adrenal damage. Adrenal cortex extract and sodium chloride were very beneficial (Talbot, Lever and Consolazio³⁹).

Grüneberg⁴⁰ obtained striking improvement with cortical extract in 12 cases of severe psoriasis out of 58.

Ludy and Applestein⁴¹ reported benefit in half of their cases of allergic dermatitis treated with a glycerin preparation of the adrenal.

Carrie⁴² found that administration of adrenal cortex extract decreased the intensity of the erythema produced by ultraviolet radiation.

In all of these conditions there might have been some change in permeability which adrenal cortex extract corrected.

The circulatory changes and fluid shift which occur in the crisis of adrenal insufficiency resemble those of surgical shock. Consequently adrenal preparations have been used to prevent surgical shock. Reed⁴³ studied 50 cases, making injections before and after the operation. Excessively rapid pulse was prevented and the gastrointestinal symptoms were mitigated. Selye and his associates⁴⁴ and Weil, Rose and Browne⁴⁵ found that adrenal cortex extract was effective in combating shock but that desoxycorticosterone was ineffective.

The pathologic changes produced in the adrenals from superficial burns indicate the possibility of adrenal insufficiency. In such conditions the symptoms that develop are similar to those in adrenal failure. We⁴⁶ treated 1 patient, beginning on the third day after severe

burns when she had had convulsions and could not retain fluids. The response was similar to that obtained in the coma of Addison's disease. Wilson and his associates⁴⁷ treated severe burns with similar results.

Adrenal cortex extract has been used to mitigate the ill effects of fever therapy. Our group at Ohio State University has studied the plasma electrolytes under these conditions. Without treatment there was some loss of sodium chloride. With the extract this was prevented. There was a decided difference in the subjective symptoms. Asthenia was reduced. Nausea and vomiting were lessened and the time required to recover was decreased.

Therefore the results tend to indicate that, while the decreased loss of electrolytes undoubtedly plays a role in the alleviation of the distress caused by fever therapy, there is a further action by the extract. Subjective observations indicate an effect on the central nervous system. Adrenal cortex extract removes apprehension on the part of the patient. He has fewer or no irrational periods. He is less restless and is more resistant to sedatives.

In cases of human pregnancy symptoms resembling those found in adrenal insufficiency may develop. Some years ago we⁴⁸ treated such a patient with adrenal cortex extract with considerable success, but not until Freeman, Melick and McClusky⁴⁹ treated 78 pregnant women suffering from nausea and vomiting was there sufficient evidence for serious consideration. The beneficial results obtained by these workers as well as by Stemmer⁵⁰ and also by Wagner⁵¹ indicate that adrenal cortex extract may prove to be a valuable adjunct in the treatment of vomiting of pregnancy.

This brief review indicates the possibilities of adrenal cortex preparations. Although they are specific for Addison's disease, a much wider application may be found in other clinical conditions. Judicious experimentation will be required to establish their use further. One may look forward to the day when they will play a part in general practice.

47. Wilson, W. C.; Rowley, G. D., and Gray, N. A.: Acute Toxicity of Burns: Extract of Suprarenal Cortex in Treatment, *Lancet* 1:1400-1402 (June 20) 1936.

48. Hartman, F. A.; Thorn, G. W., and Potter, I. W.: Cortin in a Case of Possible Adrenal Insufficiency During Pregnancy, *Endocrinology* 16:155-156 (March-April) 1932.

49. Freeman, W.; Melick, J. M., and McClusky, D. K.: Suprarenal Cortex Therapy in Vomiting of Pregnancy: II. Results in Seventy-Eight Cases, *Am. J. Obst. & Gynec.* 33: 618 (April) 1937.

50. Stemmer, W.: Treatment of Vomiting of Pregnancy by Means of Adrenal Cortex (Cortin), *Zentralbl. f. Gynäk.* 59: 456-458 (Feb. 23) 1935.

51. Wagner, B.: Management of Hyperemesis Gravidarum with Adrenal Cortex Hormone: A Study of Endocrine Conditioned Metabolic Disturbances as Causes of Hyperemesis Gravidarum, *Zentralbl. f. Gynäk.* 63: 432-441 (Feb. 25) 1939.

38. Robbins, J. H.: The Use of Cortin in a Case of Acute Hypoadrenalism Occurring as a Sequel of Acute Streptococcic Sore Throat, *J. A. M. A.* 100: 657-658 (March 4) 1933.

39. Talbot, J. H.; Lever, W. F., and Consolazio, W. V.: Metabolic Studies of Patients with Pemphigus, *J. Invest. Dermat.* 3: 31-68 (Feb.) 1940.

40. Grüneberg, T.: Psoriasis and the Suprarenal Cortex: II. The Influence of Cortical Extracts and Vitamin C on Psoriatic Conditions, *Arch. f. Dermat. u. Syph.* 173: 1-26, 1935.

41. Ludy, J., and Applestein, R.: Allergy and the Treatment of Allergic Dermatitis with Cortical Extract of the Suprarenal Gland, *M. Rec.* 150: 285 (Oct. 18) 1939.

42. Carrie, D.: Investigations on the Influencing of Inflammatory Processes in the Skin, *Arch. f. Dermat. u. Syph.* 178: 92-98, 1938.

43. Reed, F. R.: Acute Adrenal Cortex Exhaustion and Its Relationship to Shock, *Am. J. Surg.* 40: 514-528 (June) 1938.

44. Selye, Hans; Dosne, C.; Bassett, L., and Whittaker, J.: The Therapeutic Value of Adrenal Cortical Hormones in Traumatic Shock and Allied Conditions, *Canad. M. A. J.* 43: 1-8 (July) 1940.

45. Weil, P. G.; Rose, B., and Browne, J. S. L.: The Reduction of Mortality from Experimental Traumatic Shock with Adrenal Cortical Substances, *Canad. M. A. J.* 43: 8-11 (July) 1940.

46. Hartman, F. A.: Studies on the Function and Clinical Use of Cortin, *Ann. Int. Med.* 7: 6-22 (July) 1933.

Spectacles and the Microscope.—The invention of the microscope, which had such important bearing on the progress of medicine, may be attributed to the influence of the spectacles trade on the science of optics. This science had engaged the attention of Euclid (about 300 B. C.), of Ptolemy (A. D. 127-151) and of the Arab Alhazan in the eleventh century, but no practical use was made of the possibility of magnification by curved surfaces. Roger Bacon had realized the value of lenses as an aid to sight, but after he was imprisoned his works were hidden until 1733, so that his contributions to optics did not influence the development of the microscope. Spectacles were invented in Italy about 1285 by Salvino degli Armati, but it was not until the sixteenth century that the spectacles trade developed to any considerable degree. The consequent revival of optical science led to the invention and development of both the simple and compound microscope.—Stern, Bernhard F.: *Society and Medical Progress*, New Jersey, Princeton University Press, 1941.

THROMBOSIS OF THE LATERAL SINUS

AN ANALYSIS OF RESULTS OBTAINED IN
ONE HUNDRED AND NINETEEN CASES

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Thrombosis of the lateral sinus is the most frequently encountered intracranial complication of mastoiditis, and because of the large number of diseases which it may simulate it is of great interest not only to otologists but to internists. It is my purpose in this paper to present clinical observations made over twelve years on 119 patients with thrombosis or phlebitis of the lateral sinus admitted to the Manhattan Eye, Ear and Throat Hospital. As there is no standard for reporting data on thrombosis of the lateral sinus it would be difficult to compare our data with those reported by other investigators. Therefore, no attempt has been made to survey the literature. Most of the observations were made and recorded by me while the patients were under the care of the various members of the surgical staff.

The cases are divided into two series, those occurring from 1929 to 1936 inclusive, before the advent of sulfanilamide and its derivatives, and those occurring from 1937 to 1940 inclusive, after the advent and use of these drugs. As far as possible, a comparison is made of the two series to determine whether any progress has been made in the management of thrombosis of the lateral sinus.

INCIDENCE OF THROMBOSIS OF THE LATERAL
SINUS AND GENERAL ANALYSIS OF CASES

From 1929 to 1936, 4,983 mastoidectomies, including simple, modified radical and radical operations, were performed. The yearly number varied from 495 in 1936 to 848 in 1931, averaging 623 (table 1). During these eight years 95 cases (1.9 per cent) of thrombosis of the lateral sinus were encountered. The smallest yearly number was 8 (in 1936), the largest 14 (in 1931) and the average about 12. Thirty-one patients (32.6 per cent) died. In 4 cases of definite meningitis death occurred within twenty-four hours after admission. If these 4 hopeless cases are deducted the mortality is reduced to 28.4 per cent. It could have been still further reduced had my associates and I been less conservative and operated on more patients with signs suggestive of sinus thrombosis, who recovered after free exposure of the lateral sinus. The highest mortality (50 per cent) was in 1931. In that year also we encountered a comparatively large number of patients with severe orbital cellulitis which terminated in thrombosis of the cavernous sinus and death. It seems that in some years the micro-organisms are more apt to enter the blood stream, depending on the virulence of the infections of the upper respiratory tract, which varies from year to year. This fact must be remembered when the effects of chemotherapy on the occurrence of mastoiditis and its complications are evaluated.

From 1937 to 1940, 1,854 simple, modified radical and radical mastoid operations were performed (table 2). The smallest yearly number was 377 (in 1940) and the largest 598 (in 1937), the average number being 463.5. There were 24 cases (1.2 per cent) of thrombosis of the lateral sinus within four

years. The average number per year was 6, i. e. half of the first series. Three patients (12.5 per cent) died.

During the twelve year period 6,837 mastoidectomies were performed. The total number of cases of thrombosis of the lateral sinus was 119 (1.7 per cent). In each series the lateral sinus on the right was more frequently involved than that on the left; the uneven incidence may have been due to the fact that the right is usually larger than the left and is therefore covered by more cells in the mastoid. The cases of acute mastoiditis exceeded cases of chronic mastoiditis by considerable numbers in both series. The number of males and females in the two series was about the same.

Because of the unequal length of time of the two series, which makes comparison difficult, I shall consider the statistical material of both with regard to instances in which the introduction of sulfanilamide and its derivatives had no appreciable effect.

In table 3 it is shown that in the preponderance of cases thrombosis occurred in patients between the

TABLE 1.—Analysis of the Cases of Mastoidectomy

	Series 1, 1929 to 1936								Summary
	1929	1930	1931	1932	1933	1934	1935	1936	
Number.....	497	570	848	642	690	604	673	495	4,983
Sinus thrombosis.....	13	13	14	13	12	11	11	8	95
Percentage.....	2.6	2.3	1.6	2	1.7	1.8	1.6	1.7	1.9
Males.....	8	3	6	8	7	6	4	4	46
Females.....	5	10	8	5	5	5	7	4	49
Mastoiditis									
On right.....	4	9	6	7	7	2	7	5	47
On left.....	6	4	6	4	4	7	2	3	36
Bilateral.....	3	..	2	2	1	2	2	..	12
Acute.....	10	9	12	11	9	11	10	7	79
Chronic.....	1	1	2	1	..	..	..	1	6
Acute and chronic.....	2	3	2	..	2	..	1	..	10
Hemolytic streptococcus bacteremia.....	6	2	1	4	6	7	6	6	38
Hemolytic staphylococcus bacteremia.....	..	..	..	1	..	..	1	..	2
Type III pneumococcus bacteremia.....	..	1	3	2	1	1	2	..	10
Deaths.....	4	4	7	3	4	4	3	2	31
Percentage.....	30.7	30.7	50	23	33.3	36.3	27.2	25	32.6*

* If one deducts 4 hopeless cases, the corrected mortality is 28.4 per cent.

ages of 1 and 10 years. The frequency of this disease after the age of 20 diminishes considerably. In elderly patients it seems to be rare.

THE WALLS AND CONTENTS OF THE
LATERAL SINUS

In 35 cases the walls of the lateral sinus were apparently normal (table 4). After incision of these walls a thrombus was found in 11 cases (31.4 per cent). That the appearance of the sinus wall gives no indication of what may be within is well known to otologists. In the presence of a perisinus abscess one has more reason to suspect a sinus thrombosis. Among 37 cases of perisinus abscess a clot was found in 26 (70 per cent).

There is always the possibility of error in determining whether there is a clot in the lateral sinus. In some cases of free bleeding a parietal thrombus may be present but cannot be demonstrated.

Type of Mastoid.—In 81 cases the mastoid was pneumatic, in 15 noncellular and in 2 infantile, and in 21 the type was not recorded. In the majority of cases in which there was an apparently normal sinus wall and a clot within, the mastoid was pneumatic, contrary to the prevailing impression that thrombosis develops more frequently in poorly pneumatized bones.

POSTOPERATIVE COMPLICATIONS

In the first series there were 15 cases of meningitis terminating in death (table 5). In the second series there were 2, with 1 recovery and 1 death. In 5 cases in series 1 there was abscess of the brain, with 1 recovery and 4 deaths. In 2 of these the thrombosis

TABLE 2—Analysis of the Cases of Mastoidectomy

	Series 2, 1937 to 1940					Total, 1929-1940
	1937	1938	1939	1940	Summary	
Number	598	475	404	377	1,854	6,837
Sinus thrombosis	3	9	7	5	24	119
Percentage	0.5	1.9	1.7	1.3	1.2	1.7
Males	2	5	6	4	17	63
Females	1	4	1	1	7	56
Mastoiditis						
On right	2	7	4	3	16	63
On left	1	2	2	2	7	43
Bilateral			1		1	13
Acute	2	6	5	3	16	95
Chronic		1		1	2	8
Acute and chronic	1	2	2	1	6	16
Hemolytic streptococcus bacteremia	1	3	2	1	7	45
Hemolytic staphylococcus bacteremia		1			1	3
Type III pneumococcus bacteremia				1	1	11
Deaths	0	1	2	0	3	34
Percentage	0	11	28	0	12.5	28.5*

* Corrected total mortality 25 per cent (compare with table 1)

of the lateral sinus and the abscess of the brain were not recognized during life but were observed at autopsy, the abscess in 1 being cerebellar and in the other of a frontal lobe. One could see in the latter the tributary vein along which the infection had traveled against the blood stream to the frontal lobe. In the third case, operation on the sinus and the jugular vein was delayed and an abscess of the temporosphenoid lobe developed. In the fourth case the inner wall of the right lateral sinus was injured during operation. A superficial cerebellar abscess developed and was drained. Later, signs of a cerebellar abscess on the left appeared, for which an operation was performed. At autopsy it was disclosed that this abscess was fibrotic and practically obliterated, but in the right part of the cerebellum one large and three small abscesses were observed. The fifth patient, who recovered from a cerebellar abscess, had both lateral sinuses obliterated and one jugular vein resected. There were no abscesses of the brain in the second series.

TABLE 3—Age Incidence

Age of Patient	Series 1 and 2	
	Number of Cases	Percentage
1 to 5 years	17	15.8
6 to 10 years	39	32.7
11 to 15 years	13	12.1
16 to 20 years	12	10.1
21 to 25 years	4	3.7
26 to 30 years	11	9.1
31 to 35 years	5	4.2
36 to 40 years	9	7.5
41 to 50 years	5	4.2
51 to 60 years	3	2.8
61 to 70 years	1	0.9

There were 2 cases of erysipelas in the first series. In 1 of these onset of the disease preceded operation on the sinus and the jugular vein by two weeks, and in the other, in which the lateral sinus was injured during the mastoid operation, it followed ten days after operation on the sinus and the jugular vein.

There was 1 case of labyrinthitis and paralysis of the facial nerve in each series. Involvement of the sixth cranial nerve was recorded in 2 cases in the first and in 1 in the second series. In 1 case in series 1 the hypoglossal nerve was involved, indicating thrombosis of the anterior condyloid vein. Disturbances of the ninth, tenth and eleventh cranial nerves, which may become implicated in thrombosis of the lateral sinus and the bulb of the jugular vein, were not recorded.

In series 2 there was the unusual complication of a tumor of the brain. In the right lateral sinus an infected thrombus was found. The patient continued to suffer extreme pain. There were other symptoms and signs pointing to a neoplasm of the brain, for which the patient was operated on in another hospital. A spongioblastoma of the left parietal lobe was found.

The other complications listed in table 5 are self explanatory.

METASTASIS

Metastasis occurred in 25 cases (26.3 per cent) of the first series (table 6). In 18 there was a positive blood culture and in 9 a thrombus. Metastasis was more common in the acute cases and appeared with much greater frequency after operation on the lateral sinus and the jugular vein. The frequency after operation coincides with the observation of Meltzer.¹

TABLE 4—Changes Seen at Operation on Lateral Sinus

	Series 1 and 2 Before Incising Sinus Number of Cases	After Incising Sinus	
		Free Bleeding	Clot
Normal sinus	35	24	11
Thickened or discolored wall	19	14	5
Granulations only	12	5	7
Perisinus abscess	37	11	26
Incomplete data	16		
Summary	119	54	49

Metastatic abscesses appeared in either the large joints or the subcutaneous tissues or both. There was one exception, however, in that multiple abscesses developed in the lungs of a patient who had staphylococcal bacteremia and died. The reason for the rare occurrence of metastasis to the viscera is not known. It is possible that the interstitial tissues provide a better hiding place for the bacteria.

Metastasis, as a complication of sinus thrombosis, did not seem in our cases to add to the seriousness of the disease. There were 7 deaths (28 per cent).

Table 6 shows that in a considerable number of cases of metastasis the walls of the sinus looked normal. This is further evidence that a normal appearance of a sinus wall is not to be relied on. There were no cases of metastasis in the second series.

Temperature—The temperature curve varied. In 83 cases (69.7 per cent) it showed the characteristic fluctuations, ranging from 97 to 108 F; in 15 it was sustained at a high level; in 19 it was irregular, and in 2 it was within normal limits. There were severe chills in 46 cases (38.6 per cent).

After operation on the lateral sinus and the jugular vein the temperature returned quickly to normal and remained thus in 18 cases. There was a slow return to normal in 49 cases, recurrent sepsis in 18 and continued sepsis and death in 34.

¹ Meltzer, P. E. Treatment of Thrombosis of the Lateral Sinus. Arch. Otolaryng. 22: 131 (Aug.) 1935

PAINS OF GREAT SEVERITY

In 14 cases severe, persistent, deep boring pain that did not respond to analgesics and was suggestive of the formation of an abscess of the brain dominated the clinical picture. Neurologic consultation resulted in a decision to wait until the suspected abscess had been walled off and more definite signs of localization had developed. In 2 cases already referred to autopsy revealed not only unsuspected thrombosis of the lateral sinus but in 1 a cerebellar abscess and in the other an abscess of the frontal lobe. Timely recognition and intervention might have resulted favorably. That sinus thrombosis alone may produce severe pain and other symptoms simulating those of abscess of the brain is shown by the following case:

A man aged 27 was admitted to the hospital on Nov. 15, 1931 with an acute exacerbation of chronic mastoiditis on the left. The following day a radical mastoid operation was performed. An epidural abscess over the middle fossa was found. There were bubbles of gas escaping from the pus, which yielded a pure culture of colon bacilli. The wall of the lateral sinus appeared normal. The blood culture was negative. Because of extremely severe pain in the left side of the head, the epidural abscess and the normal appearance of the wall of the lateral sinus, the temporosphenoid lobe was explored, but no pus was found. On November 19 the

TABLE 5.—Postoperative Complications

	Series 1		Series 2	
	No. of Cases	Deaths	No. of Cases	Deaths
Meningitis.....	15	15	2	1
Subdural abscess.....	2	1	..	..
Abscess of brain.....	5	4	..	..
Temporal.....	1	1	..	..
Cerebellar.....	3	2	..	..
Frontal.....	1	1	..	..
Paralysis of abducens nerve.....	1	1	1	0
Erysipelas.....	2	0	..	..
Diabetes.....	2	1	..	..
Lobar pneumonia.....	5	1	..	..
.....	2	2	1	1
.....	1	1	..	..
Herpes zoster.....	1	1	..	..
Tumor of brain.....	..	..	1	0

lateral sinus was incised. A clot, extending from the knee to the bulb of the jugular vein, was found. After the clot was removed there was free bleeding from the torcular end but no bleeding from the bulb. The jugular vein was then resected. Because of the continuation of chills and a high temperature, it was thought advisable to revise the operation. This was done, but the patient died of meningitis.

The fatal outcome in this case impresses one with the advisability of investigating and incising even a normal appearing lateral sinus before exploring the brain for a supposed abscess when there are only suggestive signs and no localizing ones.

In 2 of our cases severe abdominal pain suggesting an acute abdominal condition was a prominent symptom. In 1 an appendectomy was performed. The appendix was practically normal. In order to avoid surgical procedures on the abdomen in such cases it should be kept in mind that spastic abdominal pain may occasionally be caused by reflex irritation of the vagus nerve.

DIAGNOSIS

As a rule it is not difficult to make a correct diagnosis of thrombosis of the lateral sinus. It is of course essential that other diseases, such as erysipelas, pneumonia, pyelonephritis, acute bacterial endocarditis, acute

tonsillitis and acute nasopharyngeal infections, which may cause symptoms similar to those induced by thrombophlebitis, should be ruled out. The closest cooperation between the otologist and the internist or the pediatrician is required. That thrombosis of the lateral sinus may exist without clinical signs and symp-

TABLE 6.—Incidence of Metastasis

	Series 1		Series 2
	Number of Cases	Positive Blood Culture	No Metastasis
Metastasis.....	25	18	
Acute otitis.....	23	16	
Chronic otitis.....	1	1	
Acute and chronic otitis.....	1	1	
Metastasis before operation on sinus.....	3	1	
Metastasis after operation on sinus.....	22	17	
Deaths from acute otitis.....	7 (28%)	5	
Deaths from chronic otitis.....	0		
Status of Sinus Wall in Cases of Metastasis			
	No. of Cases	Thrombus	Free Bleeding
Normal wall.....	7	3	4
	5	1	4
	2	1	1
Perisinus abscess.....	6	4	2
Condition not stated.....	5	..	..

toms is well known. In 2 of our cases in which this disease was unsuspected it was discovered accidentally at the mastoid operation, in 2 other cases at the post-mortem examination and in 1 by histologic examination of the temporal bone.

The clinical picture of infection of the lateral sinus is usually recognized by the characteristic temperature curve, made up of quick rises and abrupt falls, and by accompanying rigor, profuse perspiration, metastatic abscesses, progressive anemia and a positive blood culture.

Blood Cultures.—Studies of blood cultures are of paramount importance in the diagnosis of thrombosis of the lateral sinus. The advent of sulfanilamide and its derivatives has given the early recognition of bacteremia even greater significance than it had heretofore.

TABLE 7.—Analysis of Blood Cultures

	Number of Cases	Before Operation* Only	After Operation Only	Before and After Operation	Thrombus	Deaths
Series 1						
Hemolytic streptococcus.....	38	27	3	8	17	13 (34%)
Hemolytic staphylococcus.....	2	1	1	0	0	0
Pneumococcus, type III.....	10	9	0	1	6	7 (70%)
Streptococcus viridans.....	1	1	0	0	1	0
Positive.....	51	38	4	9	23	20 (39%)
Negative.....	38†	..	..	..	17	11 (28%)
Series 2						
Hemolytic streptococcus.....	7	5	1	1	4	0
	1	0	1	0	1	1
	1	0	0	1	0	0
	1	1	0	0	1	0
Positive.....	10	6	2	2	6	1 (10%)
Negative.....	14	..	..	..	3	2 (14%)

* I. e., operation on the lateral sinus.

† No record in 6 cases.

In the first series the culture was positive in 51 cases (table 7). In 38 of these a hemolytic streptococcus was found and in 10 *Pneumococcus* type III. The latter number is unusually large but can be explained by the fact that our hospital draws patients from many communities. It also accounts for the high mortality rate

in series 1, as 70 per cent of the cases of type III pneumococcus bacteremia terminated fatally. A hemolytic staphylococcus was found in 2 cases and Streptococcus viridans in 1. In the second series the blood culture was positive in 10 cases. Of these, a hemolytic streptococcus was present in 7, Pneumococcus type III

TABLE 8—*Examination of the Ocular Fundi**

	Series 1 and 2		Dilatation of Veins	Optic Neuritis	Papilledema
	Number of Cases	No Change			
Sinus thrombosis	42	25	5	1	11
Cerebral abscess and sinus	2	1		..	1
"	3		..	..	3
Uremia and sinus thrombosis	8	1	1	2	4
Summary	56	27	6	4	19

* There was no record of examination in 63 cases

in 1, a hemolytic staphylococcus in 1 and the colon bacillus in 1. Whether Str. viridans and the colon bacillus can cause thrombosis of the lateral sinus is questionable, but in both of these cases a thrombus was demonstrated. In the two series combined the blood culture was positive in 61 cases (51.3 per cent). In 6 cases it became positive after operation on the lateral sinus and the jugular vein, which seems to show that the operations did not prevent the bacterial invasion of the blood stream.

A negative blood culture does not exclude thrombosis of the lateral sinus, as was shown in series 1 in 17 cases and in series 2 in 3 cases. Therefore, a negative blood culture per se should not be an indication to delay operation when symptoms and signs point to an invasion of the blood stream.

Although laboratory tests, such as frequent blood counts and the determination of the sedimentation rate, may be of some help, I have observed the readiness with which some otologists discard their clinical judgment in favor of these tests and unduly delay operation on the lateral sinus. Time valuable in preventing the spread of the infection in the general circulation is thus lost.

The Tobey-Ayer test, properly performed and interpreted, was found to be a valuable aid, especially in cases of bilateral mastoiditis.

Ventriculography.—Thrombosis of the lateral sinus may at times be responsible for clinical signs and symptoms that suggest an abscess or tumor of the brain. When such symptoms appeared it was necessary to employ ventriculography both to clarify the diagnosis and to locate the lesion. After one obtains negative results from this procedure in some puzzling cases in which there are atypical manifestations the only requirement is to recognize that some otogenic intracranial disease is present, and, as thrombosis of the lateral sinus is the most frequent complication and the least dangerous to investigate, the exploration of that sinus before one does anything else is desirable.

Cerebral symptoms simulating those referable to abscess of the brain may occasionally occur after an operation on the lateral sinus and the jugular vein. It has been assumed that these symptoms result from a lack of collateral circulation following the operation, when the aural pathologic condition involves the side of the larger lateral sinus and the larger jugular foramen.

In 1 of our cases, after an operation on the lateral sinus, signs and symptoms simulating an abscess of the temporosphenoid lobe developed. An exploratory operation did not reveal an abscess. The neurologist then thought that the signs might be due to a small lateral sinus on the uninvolved side. Autopsy revealed suppurative meningitis but did not reveal an abscess of the brain or abnormalities of the venous sinuses.

In order to avoid dangerous and unnecessary explorations of the brain, as in the aforementioned cases, an attempt has been made by Ersner and Myers² to demonstrate by means of roentgen rays the size of the lateral sinus and the jugular foramen. However, Dr. Frederick Law, roentgenologist of our hospital, has expressed the opinion that this cannot be done with certainty.

Another possible aid in the interpretation of intracranial complications resulting from venous circulatory disturbances is preoperative and postoperative examination of the fundi of the eyes. The presence of papilledema before operation on the sinus and the jugular vein should be a sign that the venous return flow is probably already obstructed. This observation may help in the diagnosis of the severe reactions that occasionally result from lack of collateral circulation.

The eyegrounds were examined in 56 cases of thrombosis of the lateral sinus (table 8). In 19 papilledema was present, and in 8 of these there was an obliterating thrombus. Only in cases complicated by meningitis or abscess of the brain was there increased intracranial pressure. In none of the cases in which recovery took place was there atrophy of the optic nerve. In a case of papilledema of 6 diopters in each eye, which lasted eight months, I made observations at weekly intervals. At no time was there any evidence of increased intracranial pressure, and the vision returned to normal.

INTERVAL BETWEEN MASTOIDECTOMY AND OPERATION ON THE SINUS

With regard to the interval between mastoidectomy and operation on the sinus and the jugular vein, the cases fall into four groups (table 9):

Group 1, 35 cases in which symptoms of sepsis were evident from the start and in which thrombosis of the lateral sinus was diagnosed before or at the time of the

TABLE 9—*Interval Between Mastoidectomy and Operation on the Sinus and Jugular Vein*

	Series 1 and 2			
	At Time of Mastoidectomy	3 to 7 Days Afterward	8 to 14 Days Afterward	15 Days or Longer Afterward
Number of cases	35	35	25	19
Deaths	5 (14.2%)	11 (31.4%)	8 (28.5%)	8 (42.8%)
Corrected mortality*	4 (11.4%)	8 (22.8%)		

* Corrected by deducting 4 cases of meningitis, 1 from column 1 and 3 from column 2, in which death occurred within twenty-four hours after admission

surgical intervention on the mastoid. Operation was performed on the mastoid and the sinus at the same time. The mortality was 11.4 per cent.

Group 2, 35 cases in which a sinus complication was discovered in three to seven days after mastoidectomy. The mortality was 22.8 per cent.

2 Ersner, M. S., and Myers, David. Aid to Interpretation of Intracranial Complications Resulting from Venous Circulatory Disturbances of the Temporal Bone, Offered by X Ray of the Lateral Sinus and Jugular Foramen, Laryngoscope 43: 800 (Oct.) 1933.

Group 3, 28 cases in which a sinus complication was recognized eight to fourteen days after the original operation. The mortality was 28.5 per cent.

Group 4, 19 cases in which thrombosis was not recognized until fifteen days or more had elapsed after mastoidectomy. The mortality was high, 42.8 per cent.

TABLE 10.—*Analysis of Fatal Cases*

Series 1									
	Number	Acute	Chronic	Thrombus		Free Bleeding		+	—
				Acute	Chronic	Acute	Chronic		
Meningitis	15	14	1	9	1	5	..	11	4
Septicemia	8	6	2	3	1	3	1	5	3
Abscess of brain	4	3	1	3		.	1	2	2
Pulmonary complications	3	2	1	2		.	1	1	2
Subdural hemorrhage.....	1	1	.	1			.	1	.
Summary	31	26	5	18	2	8	3	20	11
Series 2									
Meningitis ...	1	1	.	.		1			1
Septicemia	1	.	1		1	.			1
Pulmonary complications	1	1	..	1		.	.	1	..
Summary	3	2	1	1	1	1		1	2

* +, positive blood culture; —, negative blood culture

The foregoing statistics show that the earlier the operation on the lateral sinus is performed the better is the chance of success.

ANALYSIS OF THE FATAL CASES

In the first series there were 26 fatal cases of acute otitis as compared with 5 of chronic otitis (table 10). In the second series there were 3 fatal cases, 2 of acute and 1 of chronic otitis. There was an infected thrombus in 20 of the 31 fatal cases in series 1 and in 2 of the 3 fatal cases in series 2. The blood culture was positive in 20 in the first series and in 1 in the second.

Since the advent of sulfanilamide and its derivatives the prognosis of thrombosis of the lateral sinus has become so favorable that every death in series 2 demands an explanation. The first case belongs to that rare group in which there are cerebral symptoms simulating those of an abscess of the brain after an operation on the lateral sinus. Meningitis developed after several explorations of the brain. The second death was due to delay in operating on the lateral sinus and the jugular vein because of a negative blood culture and other conflicting results of tests. When the operation was performed sepsis was too far advanced and could not be controlled. The third death was due to severe hemolytic staphylococcic bacteremia occurring before sulfathiazole became available.

SEQUENCE OF OPERATIVE PROCEDURES ON THE LATERAL SINUS AND THE JUGULAR VEIN

Table 11 shows the sequence of operative procedures on the lateral sinus and the jugular vein, the cases being arranged in seven groups. The best results occurred in the group in which the jugular vein was not operated on. However, it so happened that in this group operation on the sinus was performed without delay and free bleeding was established from the torcular and bulbar ends. In the group in which the mortality was highest, operation on the sinus was deferred. It seems that a favorable outcome depends more on an early diagnosis and prompt operation than on the nature or the sequence of the procedures employed.

TREATMENT

The treatment was not uniform and depended on the views of the various members of the surgical staff. In the first series of cases ligation or resection of the jugular vein was practically a routine procedure. The present tendency at our hospital is to carry out the necessary operations on the mastoid and the lateral sinus. If sepsis continues and progress is unsatisfactory, then ligation or resection of the jugular vein is considered in order.

The treatment recommended in this paper is that used in our clinic.³ It consists of free exposure of the lateral sinus. After iodoform plugs have been properly placed at the torcular and bulbar ends, the wall of the sinus and the thrombus, when one is present, are removed. Free bleeding is established if possible. When there is no bleeding from the bulbar end and sepsis is present, the jugular vein is ligated or resected. General supporting measures, including repeated transfusions of small quantities of blood, are always employed in the management of otitic sepsis.

Chemotherapy.—The advent of sulfanilamide and its derivatives has resulted in a tremendous improvement in the management of thrombosis of the lateral sinus. The amazing improvement in cases of meningitis, which is the usual cause of death from thrombosis of the sinus, is little short of miraculous. Because of the masking effect of the drugs on various signs and symptoms, their use is not recommended during suspected mastoiditis, before or after operation, unless a diagnosis of lateral sinus thrombosis or of another intracranial complication has been made. If sinus thrombosis is diagnosed, an operation on the lateral sinus is promptly performed. Chemotherapy is continued during the postoperative period and is especially useful in cases of persistent otitic sepsis. It gives the surgeon a sense of security provided he is reasonably certain that the focus has been dealt with thoroughly.

TABLE 11.—*Sequence of Operative Procedures on the Lateral Sinus and the Jugular Vein**

Series 1 and 2				
	Number of Cases	Deaths	Percentage of Deaths	
1 Exposure of sinus				
2 Ligation of jugular vein				
3 Obliteration of sinus.	17	5	29.4	
1 Exposure of sinus				
2 Resection of jugular vein				
3. Obliteration of sinus ..	29	8	27.5	
1. Ligation of jugular vein				
2. Exposure and obliteration of sinus	8	1	12.5	
1 Resection of jugular vein				
2 Exposure and obliteration of sinus	8	1	12.5	
1 Exposure and obliteration of sinus	10	1	10	
1. Exposure and obliteration of sinus				
2 Ligation of jugular vein ..	13	4	30.8	
1 Exposure and obliteration of sinus				
2 Resection of jugular vein	15	6	40	
No data as to sequence	16	5	31.2	

* In 3 cases thrombosis of the lateral sinus was not recognized clinically but was observed at autopsy

Successful therapy with sulfanilamide and its derivatives depends on the maintenance of definite concentrations of the drugs in the blood. Initial doses must be large enough immediately to establish the desired concentration (7 to 10 mg. per hundred cubic centimeters of blood), and subsequent doses should be sufficient to maintain the concentrations so established. It must be

remembered that the likelihood of a relapse is great unless prolonged chemotherapy is employed. Use of the drugs should be continued for at least a week after a clinical cure has been effected.

Selection of Drugs.—In the treatment of hemolytic streptococcus bacteremia sulfanilamide is the drug of choice. For type III pneumococcus bacteremia sulapyridine is used. For staphylococcic bacteremia, with the exception of staphylococcic meningitis, sulfathiazole should always be employed. The exception of staphylococcic meningitis is due to the fact that sulfathiazole does not pass over readily into the spinal fluid. Sulapyridine is the preferable drug for use in cases of staphylococcic meningitis as well as in cases of unknown cause. However, at present sulfathiazole is the drug most commonly used by clinicians in the treatment of all types of infections.

Chemotherapy in our cases has more than doubled the rates of recovery. Examining the results on the basis of the different micro-organisms, one finds that all patients in series 2 with hemolytic streptococcus bacteremia have recovered. One patient with type III pneumococcus bacteremia and meningitis, comatose several days, got well. His recovery was the first from this type of meningitis to occur at our hospital. One patient with hemolytic staphylococcus bacteremia died before sulfathiazole was available.

I believe that with improved methods of administration of these drugs, with adequate doses and proper concentrations in the blood stream and with prompt and thorough operation on the lateral sinus the mortality rate will be still further reduced.

SUMMARY

In a study of 119 cases of thrombosis of the lateral sinus occurring during twelve years the cases are divided into two series: (a) those occurring before the advent of sulfanilamide and its derivatives (95 cases) and (b) those occurring since the advent of these drugs (24 cases).

By the use of these drugs great progress has been made in the management of thrombosis of the lateral sinus. Chemotherapy has more than doubled the percentage of recovery. There is every reason to be optimistic about the future of chemotherapy, and as time progresses it should be possible to reduce the mortality still further.

Early diagnosis and operation without undue delay will contribute greatly to the chance of recovery.

Abscess of the brain accompanying thrombosis of the lateral sinus is infrequent in patients with mastoiditis who are seen early and remain under continued observation.

Severe pain simulating that caused by abscess of the brain may be present with sinus thrombosis per se.

In cases of mastoiditis when there is a suspected intracranial complication without definite diagnosis, first to explore the lateral sinus for possible thrombosis is safer than to resort to explorations of the brain, because thrombosis of the lateral sinus is the most frequent intracranial complication and the one least dangerous to investigate.

Unusual situations may arise after an operation on the lateral sinus and the jugular vein, when signs and symptoms develop which arouse suspicion of an abscess of the brain, without the possibility of making a definite diagnosis. Before one explores the brain, all possible aids in diagnosis should be exhausted.

ABSTRACT OF DISCUSSION

DR. GEORGE M. COATES, Philadelphia: This is the first large series of cases that I have seen reported since the advent of the sulfonamide drugs. This therapy has favorably improved the mortality rate, but it should always be borne in mind that chemotherapy will not in itself be curative and may even cause disaster if relied on too much. Surgery on the primary focus in the mastoid process is always essential and early inspection of the sinus desirable whenever suggestive or suspicious signs or symptoms appear. Nor must we forget the use of serums plus frequent small transfusions of whole or citrated blood and other supportive treatment. I cannot agree with Dr. Hubert that metastasis did not seem to add to the seriousness of the disease, since he reports that in 28 per cent of the deaths this complication was present. Whether patients who have already acquired a mural thrombosis can recover through simple exposure of the sinus is controversial, but exposure and inspection are called for in cases presenting suspicious symptoms. That the right sinus was found in this series more frequently involved than the left conforms to previous findings. I am somewhat surprised that in the series presented 70 per cent of cases of perisinus abscess were accompanied by clot formation within the sinus. My own experience had not led me to expect such a large proportion. The observation that certain neurologic signs of brain abscess may be due to a thrombophlebitis is pertinent, and this possibility should always be considered. It makes for a temptation to delay operation. I feel that in these cases it is wise to uncover the sinus and investigate, although, as pointed out, there is a chance for error here also, as the sinus may well appear normal even if there is a clot of some character within. I would like to discuss the question of ligation of the internal jugular. The plan adopted by Dr. Hubert is a rational one. Ligation is not always either necessary or successful in preventing dissemination of the blood stream infection. Much depends on the amount of development of the collateral circulation, and this cannot be known in advance. Generally speaking, however, I feel happier in a septic case if the jugular can be tied without further jeopardizing the patient by the prolongation of the operation. It can always be done at a later period if deemed necessary. If the patient is not septic, even if free bleeding is not obtained from the lower end, I do not tie, but if sepsis develops later this is immediately done.

DR. F. W. DIXON, Cleveland: I have tried to analyze our results at Lakeside Hospital since the advent of chemotherapy. In the past four years, four hundred and fifty simple and radical mastoid operations have been performed. Thrombosis of the lateral sinuses have been observed in 10 cases. These have been further complicated in that there were cerebellar abscesses in 2, a frontal lobe abscess in 1, meningitis in 4 and arteriosclerosis in 1. Seven of the 10 patients died as the result of these complications. It is therefore impossible to arrive at any opinion as to the efficacy of chemotherapy in our series. Nevertheless I feel that chemotherapy has become a most powerful weapon in combating this disease, not forgetting those time tried remedies of careful nursing care postoperatively, not disturbing the patient, a nourishing high caloric diet and repeated small blood transfusions. Thrombosis of the lateral sinus cannot be judged by the appearance of its walls. This is due to the fact that thrombosis of the lateral sinus may develop in either of two ways: Either infectious erosion of the sigmoid plate occurs followed by a perisinus abscess and this followed by a mural or a completely obliterating clot, or it may be thrombophlebitis of the small veins leading to the sigmoid sinus or jugular bulb invade these structures while the sinus plate remains intact or normal in appearance. The deep boring pain which was mentioned is significant. In the last four months I have observed 4 such cases: 2 cases of lateral sinus thrombosis and 2 of perisinus abscess in which there were no symptoms of mastoid involvement save this deep boring pain, which was nocturnal and severe and was not relieved by ordinary sedatives. That certain eyeground changes take place has been frequently observed. This probably is due to the increased intracranial pressure or stasis and may occur postoperatively after jugular ligation and is hardly a reliable diagnostic aid. The problem of opening a suspicious sinus would depend on

the preoperative condition of the patient. If the temperature has been normal, if the blood cultures are negative, if repeated blood counts remain the same and if the condition is satisfactory, watchful waiting is justifiable. If, however, the infection is advancing and the patient is losing ground, then open the sinus. Now, if the sinus is opened and found filled with pus, shall we ligate or excise the jugular vein? This might depend on whether free bleeding is obtained from both ends. If this can be accomplished, one might wait before going a few inches lower and ligate the jugular vein. There are countless small veins within the mastoid passing into the dura and the jugular bulb. It is obviously impossible to eradicate all this thrombophlebitis. If free bleeding cannot be obtained at the jugular bulb, excise a portion of the jugular vein and try to drain this purulent lake.

DR. LOUIS HUBERT, New York: With regard to the mortality of cases in which metastasis has occurred, I said that it didn't seem to increase the seriousness of the condition, because in the 25 cases in which metastasis had occurred there were only seven deaths, or 28 per cent of the 25 cases. There is another impression that I want to clear up. A few years ago there appeared an article in the *Archives of Otolaryngology* in which it was said that at the Manhattan Eye and Ear Hospital we do excisions of the jugular vein in about 98 per cent of the cases. That isn't true. In about 50 per cent of cases we do resections, in 40 per cent ligations and in about 10 per cent we don't operate on the jugular vein at all. The reason we prefer excision of the vein is more for diagnostic purposes. We don't think it has any more value than a ligation.

SULFATHIAZOLE OINTMENT IN THE TREATMENT OF CUTANEOUS INFECTIONS

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Sulfathiazole administered orally, or parenterally as its sodium salt, is effective in the treatment of many serious infections. Sulfathiazole administered locally in an ointment base should be effective in the treatment of pyogenic cutaneous infections. Actually the sulfonamide drug to be incorporated in an ointment base should not be selected until a culture from the infected area has been taken and the type of invading organism has been determined. However, it is rarely possible to obtain uncontaminated cultures from cutaneous lesions and since the staphylococcus and, to a lesser extent, the streptococcus are the most frequent invaders of cutaneous lesions, sulfathiazole seemed to be the sulfonamide drug of choice for local application in an ointment base.

A 5 per cent sulfathiazole ointment was prepared by suspending finely powdered sulfathiazole, which had been sifted also through bolting cloth to remove large crystals, into equal parts of hydrous wool fat and vanishing cream. As a preliminary study the effectiveness of an ointment prepared with sodium sulfathiazole was compared with the sulfathiazole ointment. There was no apparent difference in the clinical efficacy of the two ointments. Sulfathiazole ointment has been used solely in this study because it can be prepared by the

pharmacist with greater ease and with less cost to the patient than the sodium sulfathiazole ointment.

Patients with infected infantile and adult eczema, with impetigo, with acne vulgaris and with seborrheic dermatitis were primarily chosen for study. However, during the course of the study a few patients with other pyogenic infections of the skin received the ointment for clinical trial.

CLINICAL RESULTS

Infected Eczema.—Eight children with infected infantile eczema, ranging in age from 5 to 24 months, were admitted to the wards of the Harriet Lane Home for Invalid Children of the Johns Hopkins Hospital for treatment with sulfathiazole ointment. Each child had been treated previously in the outpatient department with either a boric acid ointment or a 2 per cent methylrosaniline solution, or both, without improvement. In 3 of the children the left side of the body was compressed with either boric acid solution, physiologic solution of sodium chloride or aluminum acetate solution, while the right side of the body was treated, in each instance, with sulfathiazole ointment. The compresses were applied continuously, whereas the ointment was applied the first thing in the morning, the last thing at night and once during the day. The areas over which the ointment was applied were wrapped with gauze and the children were restrained. Definite and similar improvement occurred on the two sides of the body in all 3 children after twenty-four to forty-eight hours of treatment. In 1 child the improvement on the side treated with sulfathiazole ointment was slower than on the side treated with compresses of physiologic solution of sodium chloride. The effectiveness of boric acid ointment and sulfathiazole ointment was compared in a similar manner in 5 children. In all of the children more rapid improvement occurred on the sides treated with sulfathiazole ointment. Treatment was carried out in each of the 8 children for a period of five to ten days. The concentration of sulfathiazole in the blood was determined every forty-eight hours. In 6 of the 8 children the blood concentration ranged from 2.0 to 3.5 mg. per hundred cubic centimeters during the entire period of treatment. Two children did not absorb the drug in detectable quantities. No changes were noted in the red blood cell counts, the hemoglobin determinations, the white blood cell counts and the microscopic examinations of the urinary sediment.

Sixteen children, ranging in age from 2 to 6 years, with infected eczema of the face, the arms and the legs were treated with sulfathiazole ointment in the outpatient department of the Johns Hopkins Hospital and the Union Memorial Hospital. The parents of each child were instructed to apply the ointment to the affected portions three times a day. No attempt was made to keep the ointment in place by bandaging. The infection was well controlled in each child after forty-eight to seventy-two hours of treatment, but the eczema remained unaltered. The children were then placed on a 5 per cent carbonis detergens ointment. One week thereafter the eczema in 13 of the children became reinfectd. The sulfathiazole was then incorporated in the carbonis detergens ointment with dramatic and persistent improvement in the infection and the eczema.

Three children ranging in age from 22 to 36 months were seen in the private offices of one of us (E. L. K.) with eczema involving the skin between the buttocks and the thighs. The parents of the children were instructed to apply sulfathiazole ointment to the affected

The Sulfathiazole Ointment was prepared and supplied to us by Hynson, Westcott and Dunning, Inc., Baltimore

From the Protein Clinic, Department of Medicine of the Johns Hopkins Hospital and Medical School; the Harriet Lane Home for Invalid Children of the Johns Hopkins Hospital and Medical School, and the Medical Service of the Union Memorial Hospital

parts every morning and every night and to keep the children as dry as possible during their sleeping hours. After ten to fourteen days of treatment the eczema had entirely disappeared and has not recurred in any of the children during the past two to three months. The concentration of sulfathiazole in the blood was determined in 2 of the 3 children every four days. The drug was not absorbed in either child. It was our impression that chronic irritation from ammoniacal diapers played an important role in the etiology of this type of eczema and that the effectiveness of the sulfathiazole ointment was attributed to its bacteriostatic properties.

An unusual opportunity arose to determine the effectiveness of sulfathiazole ointment in a 58 year old man complaining of a chronically infected eczema of the left lower leg for a period of thirty months.

The patient was admitted to the surgical service of the Union Memorial Hospital Sept. 1, 1940, twenty-four months after the onset of his symptoms. The primary purpose of hospitalization was the injection of varicose veins in the left leg. It had been the feeling of most observers that the presence of the varicose veins, even though they were not unusually prominent, played a definite role in the etiology of the patient's eczema. During twenty-four months prior to hospitalization persistent treatment with tar, sulfur and mercurial ointments had been ineffective. He had received two courses of roentgen therapy without beneficial results. For a six months' period following the injection of the varicose veins of the leg he had received, for long intervals, compresses with hot and cold physiologic solution of sodium chloride, boric acid solution and aluminum acetate solution. Hot potassium permanganate soaks and local applications of 4 per cent methylrosaniline solution had been ineffective in controlling the infection. Sulfanilamide and sulfathiazole had been given by mouth without success. Treatment with sulfathiazole ointment was begun six months after the injection of the varicose veins and thirty months after the onset of symptoms. The ointment was applied every morning and every night to the affected area and was kept in place by bandaging. After seven days there was dramatic improvement in the appearance of the lesion. The crusts had stopped forming, the weeping had subsided and epithelization had begun. After ten weeks of treatment the patient was discharged from the hospital completely well. The concentration of sulfathiazole in the blood was determined at regular intervals during the period of treatment. The drug was not absorbed in detectable quantities. No abnormal changes occurred in the red blood cell counts, the hemoglobin determinations, the white blood cell counts and the microscopic examinations of the urinary sediment. It is important to mention that on several occasions skin grafting to the affected area had been considered but had been declared hopeless because of the extensiveness of the infection.

Seborrheic Dermatitis.—A young woman of 17 years was seen in the private offices of one of us (E. L. K.) complaining of an infected seborrhea of the scalp during the late spring and the summer months since the age of 3 years. On various occasions she had received roentgen therapy to the scalp, and many different types of lotions had been applied locally. All treatment had been unsatisfactory. When she was first seen the scalp was covered for the most part with large scabs. A pure growth of *Staphylococcus aureus* was cultured from one of the involved areas. The patient was advised to remove all the scabs every morning and to apply sulfathiazole ointment every morning and every night to the affected parts. She was also instructed to wash the scalp every other morning with metaphen soap. After ten days of treatment the scalp was entirely well. She has remained well for the past six weeks by applying sulfathiazole ointment to the scalp once daily and washing the scalp once weekly with metaphen soap.

Five adult female patients with seborrheic dermatitis involving the external auditory canals and the auricles of both ears for varying periods of one to ten years have been treated with sulfathiazole ointment in the private offices of one of us (E. L. K.). Each patient had previously received local applications of 2 per cent methylrosaniline solution, 3 per cent ammoniated mercury ointment and alcohol without satisfactory results. The patients were instructed to apply sulfathiazole ointment every morning and every night to the auricles and to clean the external auditory canals, to the best of their ability, with a 5 per cent solution of sodium sulfathiazole. After forty-eight to seventy-two hours of treatment each patient noted dramatic relief from the symptoms, and after seven days the ears appeared perfectly well. All the patients have continued to apply the sulfathiazole ointment to the auricles before retiring at night, and there has been no recurrence of the lesions in the past four months. The concentration of sulfathiazole in the blood was determined at irregular intervals in 3 of the 5 patients during the period of treatment. The drug was not absorbed in detectable quantities in any of the patients. Two of the patients complained of intense pruritus, and for them sulfathiazole was incorporated in a 5 per cent carbonis detergens ointment with much relief of their symptoms.

Impetigo.—Ten children with impetigo involving the face and scalp and 2 children with impetigo involving the face, scalp and torso were treated with sulfathiazole ointment in the outpatient department of the Harriet Lane Home for Invalid Children of the Johns Hopkins Hospital. The parents of the children were instructed to remove all scabs every morning and to apply sulfathiazole ointment to the affected parts every morning and every night. After forty-eight hours definite improvement was noted in each child. After seven days all the children were well. The parents of the children commented on the simplicity and the efficacy of the treatment.

Acne Vulgaris.—Twenty nurses ranging in age from 16 to 21 years, from the Union Memorial Hospital, volunteered for treatment with sulfathiazole ointment. One nurse had severe acne, 15 had moderately severe acne and 4 had mild acne. The face alone was involved in 13 of the nurses, and the face and the back were involved in 7 of the nurses. The lesions had persisted for varying periods of one to five years. The nurses with mild acne had never before received treatment. The nurses with moderately severe and severe acne had been using various lotions containing sulfur. The one nurse with severe acne had received roentgen therapy prior to the use of sulfathiazole ointment. Each nurse was instructed to wash the affected parts every morning and every night with soap and water. No particular brand of soap was specified. They were told to use the sulfathiazole ointment as they would a vanishing cream or cold cream and to make the applications immediately after the affected parts had been washed. No dietary restrictions were made, and cosmetics were permitted. All lotions that they had previously used were discontinued. After two weeks of treatment 8 of the nurses were improved and 11 remained unimproved. One nurse discontinued the ointment because of lack of improvement and because the ointment had irritated her skin. After four weeks of treatment the 8 nurses that had improved continued to improve, and 2 nurses that had previously noted no beneficial results were definitely better. One nurse discontinued treatment because of lack of improvement.

After ten weeks of treatment 13, or 65 per cent, of the nurses were definitely improved and 5, or 25 per cent, of the nurses had failed to derive any benefit. Of the 13 nurses that improved with treatment, 4 had had mild acne and 9 had had moderately severe acne. Of the 5 nurses that failed to improve with treatment, 1 had had severe acne and 4 had had moderately severe acne. The 2 nurses that discontinued treatment had had moderately severe acne. Specimens of blood were obtained on all of the nurses at regular intervals in an attempt to determine whether or not the sulfathiazole was absorbed. The drug was not absorbed in any of the nurses.

Miscellaneous Observations.—Two adult patients with bacterial folliculitis involving the face for periods of one to three years had been fairly successfully treated with intradermal injections of staphylococcus toxin. However, there had been repeated recurrences of the lesions. The patients were instructed to apply the sulfathiazole ointment to the involved skin every morning and every night. After seven days there was definite improvement in each patient. In two weeks both patients declared that they were better than they had been since the onset of their symptoms. The state of improvement has been maintained for the past four months.

One adult patient had acquired an extensive furunculosis of both thighs following an operation for a rectal carcinoma. Many of the furuncles had been incised and all of the lesions had been covered with a 3 per cent ammoniated mercury ointment. The furuncles continued to appear and there was great concern for fear that the operative incisions might become infected. All the furuncles were covered with sulfathiazole ointment, and the skin adjacent to the furuncles was treated with sulfathiazole ointment three times a day. From the time the sulfathiazole ointment was first applied there was no further spread of the furunculosis, and the furuncles present at the time when treatment was begun immediately subsided.

Thirty-five patients with acute vesicular poison ivy dermatitis have received local applications of an ointment containing sulfathiazole and carbonis detergens. The lesions in each patient healed without infection. This seemed an important observation, as physicians generally refrain from prescribing an ointment to patients with acute vesicular dermatitis because of the possibility of promoting a secondary infection.

Thirty-three patients with cuts and 4 patients with small second degree burns have received local applications of sulfathiazole ointment. The lesions in each of the patients have healed with rapid and uniform epithelization and without infection.

SUMMARY AND CONCLUSIONS

A 5 per cent sulfathiazole ointment was prepared by suspending finely powdered sulfathiazole, which had been sifted also through bolting cloth to remove large crystals, into equal parts of hydrous wool fat and vanishing cream.

Sulfathiazole ointment was used in the treatment of 69 patients with various cutaneous infections. It appeared to be efficacious in the treatment of infected infantile and adult eczema, seborrheic dermatitis, impetigo, acne vulgaris, bacterial folliculitis and furunculosis.

No toxic effects were observed. In 6 of the 8 infants that received applications over one half of the body surface three times a day the concentration of sulfa-

thiazole in the blood ranged from 2.0 to 3.5 mg. per hundred cubic centimeters. The children and adults that received applications of sulfathiazole ointment over localized areas of the body did not absorb sufficient sulfathiazole to produce a detectable quantity in the blood, although the ointment was applied at frequent intervals throughout the day for prolonged periods.

A number of the children with infantile eczema became reinfected when a 5 per cent carbonis detergens ointment was substituted for the sulfathiazole ointment. Sulfathiazole was then incorporated in the carbonis detergens ointment, with definite and persistent improvement in the eczema and in the infection.

Thirty-five patients with acute vesicular poison ivy dermatitis, 33 patients with cuts and 4 patients with small second degree burns received local applications of sulfathiazole ointment. The lesions in each patient healed without infection.

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FIRST AID TEACHING TECHNIC

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MINNEAPOLIS

Present day warfare, with participation by the entire population in the defense and offense effort, necessitates training of the whole population, each segment for its duties. Into the public mind today the need for preparation is being instilled, and much thought is being given to devising the direction and method of training. If the whole population is to be trained for the emergencies of war, one of the first objectives will be the training in methods of first aid. In Britain such training has formed an important aspect of defense work. In this country the American Red Cross is even now extending its first aid program; plans call for an immense expansion of this training.

Without doubt, physicians will play an important part in the local programs. Red Cross units commonly have physicians among their directors and look to them for guidance in phases of activity related to health work. Whether he has a hand in directing the local program or whether he actually does the teaching, the physician may find himself in a role which he does not ordinarily have, that of participating in classroom teaching. Because of his long experience as a student, as a teacher of the individual patient and perhaps as a public speaker, he will have many qualifications valuable for classroom teaching. Nevertheless such teaching is a specialized procedure, requiring study and practice for mastery, and the physician who is equipped with and applies knowledge of good educational methods should represent the best first aid teacher.

It is possible that some of the training of the physician may condition him unfavorably for certain aspects of first aid teaching. Because of his own experiences, he may rate the pupils too high on the basis of background information and ability to understand explanations and to memorize. Even when warned and wary of dangers, mistakes may occur. In one class, after the topic of broken bones had been considered, one pupil asked "Now that we have studied about first aid for broken bones, won't you tell us how to take care of fractures?" This pupil was a college student! On another occasion a pupil asked "Will digital pressure, applied to the right arm, stop bleeding in the left arm?"

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The right arm had been used in the class demonstration. Just as the first aider should "splint 'em where they lie," so the instructor must "know the pupils." The beginning instructor almost invariably overrates the pupils as students.

The approach to becoming a good local adviser or teacher in this program entails (1) acquisition of organized knowledge relating to accident prevention, (2) acquisition of knowledge concerning good first aid procedure, (3) acquisition of knowledge concerning what the public is being taught generally in first aid classes and (4) acquisition of knowledge concerning methods in first aid teaching. Usually first aid courses consider accidents common to civilian life, using the American Red Cross First Aid Textbook. It may be that soon instructors will be provided with additional material based on the experiences in Europe and that thus the course may include topics pertaining especially to prevention and first aid care of disabilities common to warfare. The Red Cross textbook, written with the collaboration of medical men eminent in their respective fields, is exceptionally good. It gives in simple language information concerning accident prevention and first aid procedures. It is not written primarily as a textbook for physicians but rather for lay people. It considers cognitive levels and assimilative abilities of these people.

The Red Cross also issues an instructor's manual. This book is based on the large body of experience of the national organization in first aid procedures and teaching. It allocates the ground to be covered in each lecture, gives lesson plans and suggestions for class management and lists mistakes commonly made by the novice instructor.

During recent years, many lay persons having been trained in first aid, it has been possible to study the effects of first aid teaching, to ascertain whether accidents are reduced, whether graduates do good first aid work and what is the nature of the mistakes made by graduates in their first aid efforts. Conclusions can thus be drawn concerning the improvement of first aid courses.

Many studies show beyond reasonable doubt that first aid training represents an effective way to reduce accidents. Accident prevention is a major objective of first aid training; it is not a will-o'-the-wisp objective but rather one which the instructor may with confidence expect to attain. The trained first aider also handles accidents better than does the nontrained person. Physicians may smile occasionally at the work of first aiders, but by and large the trained person does good work when compared with that of the untrained. And course graduates also commonly have an improved attitude concerning matters of general health.

While the trained lay person does improved work, mistakes are occasionally made. Such mistakes include the following:

1. He is overwhelmed by the scene of the accident, modifying learned methods to the detriment of the victim's interests.
2. He fails to examine carefully.
3. When the victim has several injuries, the first aider pays attention only to the worst one.
4. He uses splints that are too short.
5. He gambles that the injury is a sprain rather than a fracture.
6. He is too free with the application of a tourniquet.
7. He handles burns poorly.

8. He applies artificial respiration when he should not do so.

9. He does not organize his first aid efforts efficiently and thus copes poorly with shock.

These mistakes suggest three avenues toward improvement of first aid teaching: better preparation of the pupils concerning general difficulties faced at the scene of an accident; presentation in succinct form of essentials for care of each accident type, with emphasis thereon rather than on details; provision in the home and automobile of splints and bandage material of adequate size for coping with major accidents.

In preparing the first aid course, it is necessary to plan for the entire course rather than for the isolated lecture. The subject matter we want to teach must be specifically defined; then such subject matter objectives must be weighed against the pupils' abilities to learn in the allotted time. One cannot teach nearly everything one may want to teach; the subject matter must be ruthlessly slashed perhaps, for only the most important can be considered. But the total usable learning is increased through the indelible imprinting of the essential. These most important facets should be presented in brief form with crystal clarity; they should be emphasized again and again. Before a class, the instructor should have in mind the things he expects to emphasize specifically; thus "Today I will clinch the idea that accident victims must be carefully examined," or "Today, in considering first aid for concussion, I am going to drive home the idea that victims must be kept quiet." The instructor will keep to his outline and to his sequence and not be diverted into a morass of side aspects. The physician knows so much, he has had so many interesting experiences, that it becomes easy for him to overflow the banks of the essentials. Eliminating consideration of aspects fairly but not essentially important is like pulling teeth; but it must be done often in first aid teaching for the lay public if the heart of the topic is to be presented emphatically.

In preparing the pupils for the scene of the accident it is important that they visualize the difficulties and common mistakes of the first aider. The lecture which treats of this topic and imparts general rules applicable in any accident is no doubt the most important one in the entire course.

To appreciate the difficulty of preparing an effective lecture on this topic, one which will in the dim future result in a good first aid job, one need only reflect on the teaching task. Ordinarily the students in the course are not conditioned to sweat in study. They expect the facts to come in gently. Yet it is the teacher's responsibility to face the teaching situation. The course is usually of only twenty hours, and there is much ground to be covered. Much of the time must be spent in doing first aid practice procedures, so that only part of the time can be devoted to lectures. Yet, despite possible deficiencies of the pupil in ability, motivation and time, this pupil must remember—if the teaching is to be effective—material for an accident which may not occur for many years. There are many kinds of accidents, but the student must remember what to do for the one which, unheralded, occurs. Meanwhile he has seldom had time for review.

Then, when the accident occurs, this pupil is in a new situation, a dramatic one perhaps. He does not have an opportunity at this time to sit down and cogitate about the whole matter in peace and quiet. He may be deluged by the enormity of the harm, by the presence

of death, by the onlookers, hysterical relatives, injured victims, importunate bystanders. Necessary apparatus, prepared or improvised, may be difficult to obtain. Zero weather, heavy rainfall or concomitant traffic may in effect represent forces which nullify all the teaching. And so he may regard the accident he meets as different from any studied or, while knowing what is correct procedure, surrender to the exigencies of the occasion and give poor first aid.

Attention may then well be directed at the following:

1. Every accident seems different, unique. The general rules should be followed unless one is positive that modification is indicated. The student who knows the common mistakes of the first aider is fortified against making them himself.

2. A careful examination is very important. The first aider is strongly tempted to give only a superficial examination, to hurry through it. A good examination requires deliberation, time, tact.

3. In the presence of serious injuries, other injuries should be searched for and, if present, treated with care.

4. There is tremendous pressure, at the time of a serious accident, that something be done. Doing nothing other than keeping the victim quiet and warm for the time being is often the indicated procedure, but such action is most difficult. The victim and the onlookers interpret this deliberation as a sign that the first aider does not know what to do. Physicians, police and firemen in first aid work subscribe to the statement that this great importunity exists at the scene of the accident.

5. Advice from bystanders is often confusing, occasionally commanding. The first aider, recalling only tenuously what is right, may easily be swayed by others.

6. The drunken are usually hard to handle when injured; they are especially likely to be hysterical, often claim to be hurt far worse than they really are. Yet drunkards are often involved in accidents, may be seriously injured; hence the first aider can take no chances and must be persistent in his examination. Some people seem to feel that a drunkard has forfeited the right to receive good first aid.

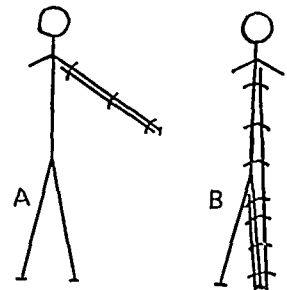
7. Very often it is wise to call a physician to the accident scene. Permission of the victim or of a responsible person should first be secured, if possible. In all serious accidents, the first aider should consider carefully this possibility of getting a physician to the scene of the accident.

Students occasionally do not learn clearly some of the first aid procedures. In the flood of details presented to them, they do not see the principles of care. The instructor should think of (1) imparting the facts and (2) having the students bring the facts back to him. Thus they learn better, for they must do the stating and must participate; they secure repetition through the process and learn of their own deficiencies. The instructor learns of their misconceptions and finds where his teaching has fallen short. The Red Cross textbook has more than 250 pages; the material in it will not be uniformly well remembered through the years. If the teacher considers carefully every paragraph, he will not gain emphasis; he will fail to impress the essentials indelibly. It is easy to get far too much detail, to lose perspective view. The teaching should conform to the practical situation and the teacher bear in mind the weighting of topics and be guided by subject matter, pupils, objectives.

Let us take the case of fracture care. There are more than two hundred bones in the body. One cannot reasonably expect that students will remember through the years the ideal splint for each type of fracture considered in the textbook. Yet teachers occasionally spend time to no real purpose on requiring the memorization of such terms as femur, humerus and vertebra. The student should understand thoroughly the idea in splinting: to keep the broken ends quiet. He should understand thoroughly the treatment of shock and the factors that increase shock. For emphasis the following suggestions may be stressed:

1. Don't let the broken ends move.
2. Treat shock.
3. Treat every possible fracture as a fracture.

A general rule for splinting is that the splints should extend well beyond the joints adjacent to the fracture. For purposes of lay education, one may state that by and large a splint can hardly be too long except it becomes unwieldy. A heavy splint, poorly attached, may contribute more to shock than a light one so placed. Students should have considerable practice in applying splints so that they learn to organize, prepare and expedite their efforts and to apply them well. They must learn how to transport a victim a few feet, if such is necessary in order, for instance, to escape traffic. They must get practical help concerning improvisations. Too often recommendations are impractical to the scene of the accident. The first aider may find that raw material for improvisations may not be as easy to find as he had thought, for he may encounter his accident in heavy rainfall, darkness or bitterly cold weather. Under these circumstances, if he spends time looking for fallen boughs, fence posts, or random boards, the victim may sink into deep shock. It is exceedingly important that the teaching recommendations foresee the practical situation.



A, fracture of elbow with arm straight; B, fracture of femur without traction.

I have used the accompanying diagrams in summarizing where splints should be placed and I ask students to repeat the drawings after they study the textbook.

The students are commonly surprised that the learning on this aspect becomes easy through the method used. Concerning back injuries, the students should know the implications of spinal cord injury; they should know of the insidiousness, as far as history, symptoms and signs are concerned, of this type of injury. Certainly first aid for fractures of the neck should be rendered by a physician called to the scene of the accident.

Head injuries and cerebral circulatory accidents are often encountered. Almost 50 per cent of fatal traffic accidents show concussion as the cause of death, according to National Safety Council reports. Whether concussion or stroke, the victim should be kept quiet. The care may be outlined as follows:

1. Keep the victim quiet.
2. Elevate his head somewhat if the face is red; keep it level if the face is pale.
3. Give the victim no stimulants.
4. Apply an ice cap, if available, to the head.

It is important to consider drunkenness in connection with head injuries. Often the drunkard is the victim of an accident and the injury is dismissed. The textbook discussion on this point is good.

Criticism has repeatedly been directed against various aspects of teaching on the topic of artificial respiration. Many misconceptions concerning theory are held. Henderson and Turner, in a recent issue of *THE JOURNAL*,¹ consider physiology and methods, their article being based on much research work. This article should be read by all first aid instructors. Many instructors insist on meticulous observation of minor points in administering artificial respiration. Clearly, the following points should be emphasized:

1. Get started at once.
2. Compress the chest and release twelve to fifteen times a minute.
3. Treat shock.
4. Keep the victim quiet after he starts breathing.

The student should know of the precious time interval between cessation of breathing and cessation of heart action. He should therefore know of the great need for starting artificial respiration at once. Though the prone pressure method is used ordinarily, it is occasionally impossible to straddle the victim. The student should understand the idea so that he will start artificial respiration in a boat or wherever he finds the victim.

The student should know when the method is useful. Occasionally instructors state that the procedure should be followed any time a victim is not breathing. Hence first aiders are giving artificial respiration to victims of stroke, of concussion and even of infectious disease. The argument favoring such teaching is as follows: If a victim is not breathing, artificial respiration cannot be harmful, though it may be useless. One cannot expect the average person to remember a series of indications for its use; but if this person is taught to use the method any time a victim is not breathing, he will remember such a simple rule well.

The argument fails to consider the commonest mistake of the first aider. In his excitement he administers the prone pressure method to victims who are unconscious but breathing. Such cases often represent stroke, concussion or injury to the visceral system. The procedure of artificial respiration here may represent the finishing coup; it is definitely dangerous. During the past year I have seen 2 cases in which prone pressure method was being used on victims of stroke. These injuries are very common, and if the first aider gives artificial respiration to every victim of stroke or concussion he sees he may be responsible for more dire results than the good which follows use of the method wisely. Hence students must learn when artificial respiration is to be used.

The technic of the prone pressure method requires practice for good administration. The beginning instructor should be coached in the technic by an experienced operator. Otherwise, while he may get a good exchange of air, he may fail as a teacher in being awkward or singularly atypical in method.

In consideration of shock, the important thing is the prevention and the treatment. One may require the

students to memorize thoroughly the symptoms and signs. Time devoted to one facet is obtained at the expense of time devoted elsewhere. Aside from modification of treatment with certain injuries, such as concussion and heat stroke, all accident victims should be treated through (1) heat, (2) position, (3) stimulants. The revised edition of the Red Cross textbook presents in improved fashion the first aid handling of burns. Perhaps one may look forward to better work on the part of graduates of the course in this type of accident.

The preceding paragraphs indicate the method of analyzing the subject matter in order to emphasize the heart of the topic, in order to gain emphasis. The main points should be clinched.

In order to apply methods learned, the first aider must have materials at the scene of the accident. Observation shows that in a proportion of cases graduates do not improvise material. The difficulties, they feel, are overbalanced by other factors. First aid kits provide a partial answer, but they are inadequate when the accident is a major one. They ought to be in each home and each automobile. But there should also be available in each automobile a few splints, at least six large triangular bandages, a flashlight and a jack knife. These can readily be provided and carried; certainly they can be provided more easily before than at the accident. If they are present, they will likely be used. If not present, the likelihood of transfer of the patient without splinting is greater. A film, sponsored by many medical societies and dealing with fracture care, has been widely shown to the public. This film demonstrates only the Thomas splint. But how often is the Thomas splint available at the scene of the accident? The real situation has again not been visualized. How may the situation be remedied? The answer is very simple: Have the pupils while enrolled in the course prepare the material for their own cars and homes. They can cut notches in the splints in such manner that traction splinting is possible. By teaching first aid, the teacher acknowledges its importance; he therefore is consistent when he insures application through providing necessary materials.

After the text work has been completed, a valuable teaching technic is to present hypothetical accident situations to the class, letting it work out procedures on designated victims. The pupils thus learn well the difficulties and factors to consider and also to organize their efforts. Even medical students, segregated into groups of two or three, find difficulty in planning first aid procedures for such a simple matter as splinting an ankle.

Films ought to represent an exceptionally valuable teaching aid. From them students might visualize well the scene of the accident, the discouraging aspects for good first aid, the difficulty of going ahead in a planned way and the common mistakes made. Unfortunately, available films omit particularly the aspects one would like to see. Sometimes significant omissions occur. Thus a film which suggests use of iodine on cuts ought to present some cautions when the lay public is being taught. Surgeons, when previewing films, commonly raise valid objections. However, better films will doubtless be prepared. The makers should have knowledge of the actual accident situation and experience in teaching first aid.

1. Henderson, Yandell, and Turner, J. McCullough: Artificial Respiration and Inhalation: The Principle Determining the Efficiency of Various Methods, *J. A. M. A.* 116:1508 (April 5) 1941.

PERORAL USE OF METHYL
TESTOSTERONE

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Testosterone and its derivatives have been in clinical use for the past four years, during which time their value in the treatment of testicular deficiency has become firmly established. The dramatic effects produced in eunuchs and eunuchoid patients have been reported by numerous investigators.¹ It is now recognized that these synthetic hormones have little effect in the presence of adequate testicular function and they are of value only as substitutive therapy for patients whose testicles are secreting an insufficient amount of hormone.² The etiology of the testicular deficiency may be one of many; viz., lack of proper pituitary function, inherent underdevelopment of the testicle, surgical and traumatic injuries to the testicle or its blood supply, and senility. The symptoms and physical characteristics of testicular deficiency have been fully described in previous publications.

The method of administration of these valuable hormones has been a major problem. Early studies revealed that pure testosterone had little clinical effect when injected subcutaneously. It was soon found that esterification³ increased its effect; this is probably due to the decreased rate of absorption and excretion. Most of the clinical reports have been based on the use of the propionic acid ester of testosterone (Perandren, and so on). This substance is dissolved in an inert oil and injected subcutaneously or intramuscularly. The optimal development and maintenance dosage in treatment of patients with hypogonadism has been determined by Howard and one of us.⁴ They found that 25 mg. injected two to three times a week produced the desired objective and subjective effects. The same authors later showed that these hormones could be administered in the form of hard pellets implanted subcutaneously.⁵ Such administration was more efficient and resulted in less waste of hormone. In these experiments the absorption of an average of 3 to 5 mg. a day produced the same effects as larger amounts given by subcuta-

neous injection. However, neither subcutaneous injection nor implantation in the form of pellets is an ideal method. Patients should not inject themselves with oily solutions, and treatment thus necessitates a visit to the physician's office several times a week. The subcutaneous implantation in pellet form eliminates the frequent injections, but sterile pellets are difficult to prepare. Testosterone and its derivatives have been incorporated in bland ointments and alcoholic sprays, but these methods are not as satisfactory as subcutaneous injection.⁶ Scott⁷ reported effective results in rats treated with injections of testosterone, testosterone propionate and methyl testosterone.

Peroral administration of testosterone and its various esters has been used in both animals and human beings; but the effectiveness is comparatively low and of little clinical value. Dorfman and Hamilton⁸ gave large amounts of testosterone by mouth and found the clinical response negligible even though there was a great increase in urinary androgen excretion. Miescher and Tschopp⁹ in their comprehensive study of various testosterone derivatives noted that the introduction of a methyl radical greatly enhanced the peroral effect in rats. Their results showed a 340 per cent greater increase in the weight of the prostate after the ingestion of methyl testosterone over that obtained after the ingestion of pure testosterone. Emmens and Parkes¹⁰ in their study of the effects of male sex hormones on castrate rats observed that the peroral activity of testosterone is only one tenth as great as the activity when injected subcutaneously. In the case of methyl testosterone the peroral activity is four tenths as great as when injected subcutaneously.

These encouraging experimental results of peroral administration led one of us (S. A. V.) to use methyl testosterone clinically. Early in 1939 a 14 year old boy who showed no evidence of puberty was given 30 mg. of methyl testosterone daily for several weeks. During this period the pubic hair started to grow and the penis increased considerably in size. Erections became frequent. The prostate soon became palpable and quickly reached normal size. Prostatic secretion, which was normal on microscopic examination, could be expressed. These changes, although sudden, were quite consistent with the normal onset of puberty and thus the biologic effects of methyl testosterone in human beings were not deemed conclusive at that time. In order to observe possible toxic effects it was decided to give this substance to a series of normal men before further trials on patients with testicular deficiency. Twelve men varying in age from young manhood to senility were given methyl testosterone perorally for periods of several weeks. The dose ranged from 25 to 50 mg. a day. No stimulation of sexual function was noted and no changes in the genitalia were observed. The only symptoms of toxicity which developed were diarrhea for several days in 1 patient and headache in another. These symptoms, however, soon disappeared without withdrawal of the drug.

From the Department of Urology, University of Virginia Hospital. The methyl testosterone (Metandren) used in this study was supplied by Dr. Ernst Oppenheimer of the Ciba Pharmaceutical Products, Inc., of Summit, N. J.

1. Hamilton, J. B.: Treatment of Sexual Underdevelopment with Synthetic Male Hormone Substance, *Endocrinology* **21**: 649-654 (Sept.) 1937. Foss, G. L.: Effect of Testosterone Propionate on Postpubertal Eunuch, *Lancet* **2**: 1307-1309 (Dec. 4) 1937. Vest, S. A., and Howard, J. E.: Clinical Experiments with the Use of Male Sex Hormones: I. Use of Testosterone Propionate in Hypogonadism, *J. Urol.* **40**: 154-183 (July) 1938. Kenyon, A. T.: The Effect of Testosterone Propionate on the Genitalia, Prostate, Secondary Sex Characters, and Body Weight in Eunuchoidism, *Endocrinology* **23**: 121-134 (Aug.) 1938. Webster, Bruce: The Modifiability of Growth by the Administration of Endocrine Substances, *J. Pediat.* **14**: 684-690 (May) 1939. Turner, H. H.: The Clinical Use of Synthetic Male Sex Hormone, *Endocrinology* **24**: 763-773 (June) 1939. Thompson, W. O., and Heckel, N. J.: The Male Hormone: Clinical Application, *J. A. M. A.* **113**: 2124-2128 (Dec. 9) 1939. Hesser, F. H.; Langworthy, O. R., and Vest, S. A.: Muscle Strength in Myotonic Atrophica (Dystrophia Myotonica) Improved by Testosterone Propionate, *Endocrinology* **26**: 241-243 (Feb.) 1940.

2. Rennie, T. A. C.; Vest, S. A., and Howard, J. E.: Clinical Studies with Male Sex Hormones: III. The Use of Testosterone Propionate in Impotence, *South. M. J.* **32**: 1004-1107 (Oct.) 1939.

3. Miescher, K.; Wettstein, A., and Tschopp, E.: Ueber hochwirksame Ester des Testosterons, *Schweiz. med. Wchnschr.* **66**: 763-764 (Aug. 8) 1936.

4. Howard, J. E., and Vest, S. A.: Clinical Experiments with Male Sex Hormones: II. Further Observations on Testosterone Propionate in Adult Hypogonadism, and Preliminary Report on the Implantation of Testosterone, *Am. J. M. Sc.* **198**: 823-837 (Dec.) 1939.

5. Vest, S. A., and Howard, J. E.: Clinical Experiments with Androgens: IV. A Method of Implantation of Crystalline Testosterone, *J. A. M. A.* **113**: 1869-1872 (Nov. 18) 1939.

6. Foss, G. L.: Clinical Administration of Androgens: Comparison of Various Methods, *Lancet* **1**: 502-504 (March 4) 1939.

7. Scott, B. L.: Androgenic Effects from Percutaneous Administration in Castrate Rats, *Proc. Soc. Exper. Biol. & Med.* **43**: 216-219 (Jan.) 1940.

8. Dorfman, R. I., and Hamilton, J. B.: The Urinary Excretion of Androgenic Substances After Intramuscular and Oral Administration of Testosterone Propionate to Humans, *J. Clin. Investigation* **8**: 67-71 (Jan.) 1939.

9. Miescher, K., and Tschopp, E.: Ueber orale Wirksamkeit männlicher Sexualhormone: vorläufige Mitteilung, *Schweiz. med. Wchnschr.* **68**: 1258-1261 (Nov. 12) 1938.

10. Emmens, C. W., and Parkes, A. S.: Effect of Route of Administration on Multiple Activities of Testosterone and Methyl Testosterone in Different Species, *J. Endocrinol.* **1**: 323-331 (Nov.) 1939.

Foss¹¹ later in 1939 reported the effect of this hormone on an adult eunuch and found that sexual potency could be fully maintained. McCullagh¹² described his experience with the peroral use of methyl testosterone in testicular deficiency but presented only 1 case in detail. He found that if the drug was given in three to four times the necessary amount of testosterone proportionate by injection it seemed to duplicate the effects of the latter. In a few instances he gave as much as 150 mg. a day without the appearance of any symptoms of toxicity. Spence¹³ reported satisfactory results with peroral methyl testosterone in the treatment of a 20 year old surgical castrate. Kearns¹⁴ has reported similar results following the use of peroral methyl testosterone. An interesting report by Duffy and Corsaro¹⁵ reveals the fact that methyl testosterone by mouth has been successfully used in suppression of lactation in women.

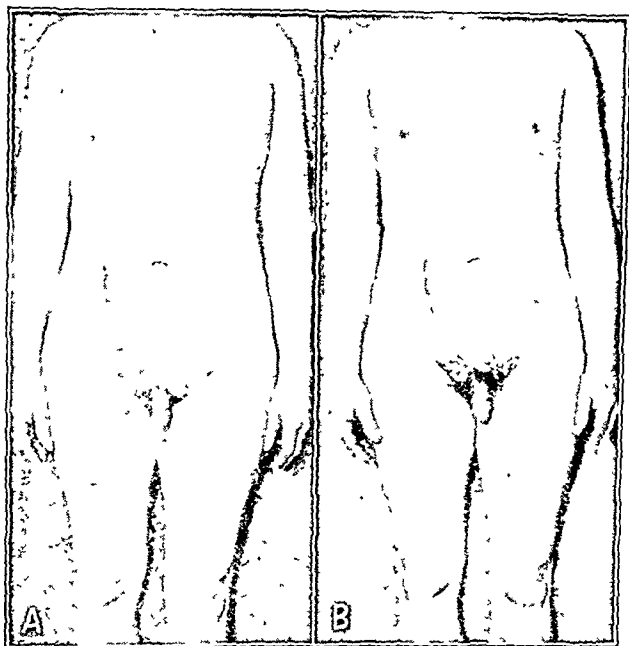


Fig. 1 (case 1)—Appearance (A) at beginning of treatment and (B) at end of first eight months of treatment with daily peroral methyl testosterone.

We have been able to observe the effects of methyl testosterone by mouth on 2 patients who have received this hormone steadily for twenty and seventeen months respectively, which is a sufficient length of time to justify a clinical report:

CASE 1.—History—J. J. J., a man aged 48, a teacher, was first seen on Jan. 4, 1940 complaining of increasing "fatigue" and lack of "drive." At the age of 17 his testicles were removed, but by what means or for what purpose the patient refused to divulge. At this time he had not quite reached full sexual or physical development. He believed that puberty was late in appearing because the penis had not fully developed, there had been no remarkable change in voice, and the pubic hair was just beginning to grow. Before castration he had experienced some sexual desire and had had erections. He mastur-

bated about once a week. Following castration there was a loss of sexual desire and discontinuance of masturbation. There was no further growth of the penis or pubic hair. There were no headaches, hot flushes or breast changes noted. While at college he began to notice lack of endurance and increasing fatigue. An animal gland was transplanted to his abdominal skin but was not effective. Nevertheless he did unusually well in his studies and eventually rose to become head of his department and teach numerous subjects. As a youth he was thin and undernourished and weighed 110 pounds (50 Kg.). During the last decade his weight had increased to 156 pounds (71 Kg.). He had been married for eight years and had intercourse about once a month. He stated that there was very little sexual desire, but coitus was terminated with a climax which was not particularly enjoyable. He did not ejaculate, although he believed a tiny amount of sticky material appeared at the meatus. His sole desire for treatment was based on increasing fatigue and lack of drive. Because of this, he felt that he could no longer carry on with his burdensome teaching. The sexual aspect of his condition presented no problem to him or to his wife and he felt that he would resent any stimulation of his sexual life. Because of his moral convictions he almost refused any treatment, as it would necessarily produce sexual stimulation.

Physical Examination.—The patient was stocky and well nourished (fig. 1A). His skin and facial appearance were typical of a eunuch. There was a very moderate amount of black hair in the axillary and pubic regions. The legs, forearms and abdomen were devoid of hair. No beard was visible, but a slight roughness could be felt on palpating the chin. The general bodily configuration was not eunuchoid (castration had taken place after skeletal maturity). The breasts were fat and rather prominent, but there was no palpable breast tissue. The scrotum was atrophic and the testes were absent. The penis was small and underdeveloped. It measured 2.5 cm. in diameter in the midshaft and 9.2 cm. in length when fully extended. The prostate and seminal vesicles, surprisingly enough, were palpable and were estimated to be about one-fourth normal size. After vigorous palpation, one tiny drop of clear secretion was obtained. This contained an occasional epithelial and white blood cell.

Treatment and Result.—Beginning on Jan. 4, 1940 the patient was given 100 mg. of methyl testosterone¹⁶ daily. The penis was engorged or erect most of the day while he carried on his classroom work; at night he had a constant complete erection. There was a sensation of irritation throughout the genitalia. It was necessary for him to have daily coitus or masturbation to afford relief. This relieved him for only about two hours, following which he would again become aggravated. After three days the dosage was reduced from 100 to 60 mg. Even on this amount there was so much sexual irritation that it was necessary to reduce the dosage further to 20 mg. or sometimes discontinue all medication for one day. By the last of January he was able to take 40 mg. a day. He noticed considerable increase in physical strength and endurance almost from the beginning of treatment. He was delighted with the increase of "mental vigor" and felt that this greatly offset the undesirable sexual stimulation. He had experienced cardiac irregularity at times for many years, but this was distinctly more frequent following treatment. During the first week of treatment there was slight headache and an increase in bowel movements, but these soon disappeared. At the end of the first three weeks his voice became more resonant and he could no longer sing high notes in the choir. During this time he gained 12 pounds (5.4 Kg.).

Throughout the next twelve months various dosages were tried. As much as 40 to 50 mg. a day produced an overstimulation of sexual desire and he had difficulty controlling erections while lecturing to his class. The presence of girl students in his classes excited him. For the greater part of the year the dosage was stabilized at 20 to 30 mg. a day. This still produced a satisfactory amount of bodily vigor. If's

11. Foss, G. L.: Oral Application of Methyl Testosterone and Its Simplification of Androgen Therapy, *Brit. M. J.* 2:1112 (July 1) 1939.
12. McCullagh, E. P.: Peroral Use of Methyl Testosterone in Testicular Insufficiency, *Cleveland Clin. Quart.* 7:226-230 (July) 1940.
13. Spence, A. W.: Preparations of Testosterone in Eunuchism and Hypogonadism, *Quart. J. Med.* 9:309-321 (Oct.) 1940.
14. Kearns, W. M.: Methyl Testosterone Administered Orally to Patients with Marked Testicular Deficiency, *J. Clin. Endocrinol.* 1:126-130 (Feb.) 1941.
15. Duffy, P. V., and Corsaro, J.: The Suppression of Lactation by Testosterone, *J. A. M. A.* 116:33-36 (Jan. 4) 1941.

mental vigor was stimulated and he was able to increase his teaching activities. He felt that he was enabled to work much harder because of this hormone.

In the past year the following changes have taken place: The penis has increased in length from 9.2 cm. to 13.2 cm. fully extended. This increase in size and length of the penis occurred during the first seven months. Since that time increase in length has been slight. Figure 1 *B* shows the patient eight months after beginning treatment. The prostate and seminal vesicles have enlarged until they are entirely within the normal limits of size and consistency. Normal secretion can be expressed. A considerable number of dark hairs up to 1 cm. long have appeared over his abdomen and to some extent over the lower legs. The pubic hair has slowly developed. There is a definite stubble over his chin and upper lip, so that he has to shave every day, whereas at the beginning of treatment he rarely shaved. Acne appeared on his face soon after beginning treatment and has been present since that time. His voice has continued to be more resonant and of a considerably lower pitch. His breasts were tender for about the first eight months after beginning treatment. There has been no palpable enlargement and no further tenderness. His weight has remained at 163 pounds (74 Kg.). He says his urine has a stronger odor and that he salivates and sweats considerably more than before beginning treatment. He is not disturbed with erections during his classes provided he takes no more than 20 mg. a day. Even on this amount he usually awakens with an erection in the morning. When he takes as much as 40 to 50 mg. a day the erections become annoying. He now has coitus two to three times a week and is rapidly changing his attitude toward this function. He no longer abhors the sexual act as he did before and states that it is definitely becoming somewhat enjoyable to him and his wife. He was greatly frightened over the prospect of not being able to obtain this hormone and says that it has opened up such a new life to him that he could no longer subsist without it.

CASE 2.—History.—A. S., a white man aged 39 (fig. 2 *A*), seen on Feb. 14, 1940, stated that he failed to experience the usual changes at puberty. His voice did not change and he developed little pubic hair. His penis remained infantile and the testes did not develop. At the age of 21 he took "some pills" prescribed by his local physician for his genital underdevelopment, but there was little improvement.

In 1930 he married and was able to have coitus once a week. During coitus there was a complete erection followed by a climax without any ejaculation. He had never masturbated in his life but had experienced a rare sexual dream without ejaculation. For the three months before he presented himself he had lost all sexual desire because of pain in his abdomen. A gastroenterostomy had been done some years before for ulcer of the stomach, and symptoms of the ulcer had recurred.

Examination.—The patient was tall, thin and considerably undernourished (fig. 2 *A*). He presented the physical characteristics of eunuchoidism. The extremities were unusually long. The skin of his face had a distinct progeric aspect. It was of fine texture, thin and pale. His voice was high pitched. No beard was present. Moderate hair was present in the axillae. There was no hair on the chest, abdomen or legs. A little pale suprapubic hair, fine in texture, was visible. The breasts were not palpable. The penis was small and measured 9 cm. when fully extended. The right testicle was fully descended and normal in consistency and contour. It measured only 4 by 2.5 cm., however. The left testis was about one-half the size of the right and was situated in the upper portion of the scrotum. The prostate and seminal vesicles were not palpable.

Further studies revealed that the patient had a carcinoma of the stomach and on Feb. 29, 1940 Dr. Bruce Morton removed his entire stomach and anastomosed the esophagus to the jejunum. Convalescence was uneventful.

Treatment and Result.—On April 2 the patient was started on 50 mg. of methyl testosterone a day. This was continued for five months, following which he took 30 mg. a day for three weeks. The dose has been further reduced to 20 mg

a day since that time. He has absorbed the methyl testosterone in spite of the absence of his stomach, as evidenced by the following changes. Within the first week after treatment was begun, spontaneous erections began to appear. They occurred at least a dozen times a day, and he noted particularly that if he lay down there would be an immediate erection. The penis was engorged most of the time. Sexual desire was noticeably increased. Coitus was performed on an average of five to six times weekly. The patient stated that he was capable of having coitus several times a day, but his wife was not desirous of this and therefore he soon restricted intercourse to three times a week. For the first time in his life he experienced the sensation of the ejaculation of fluid. He estimated the volume to be about 1 teaspoon. During the first month he

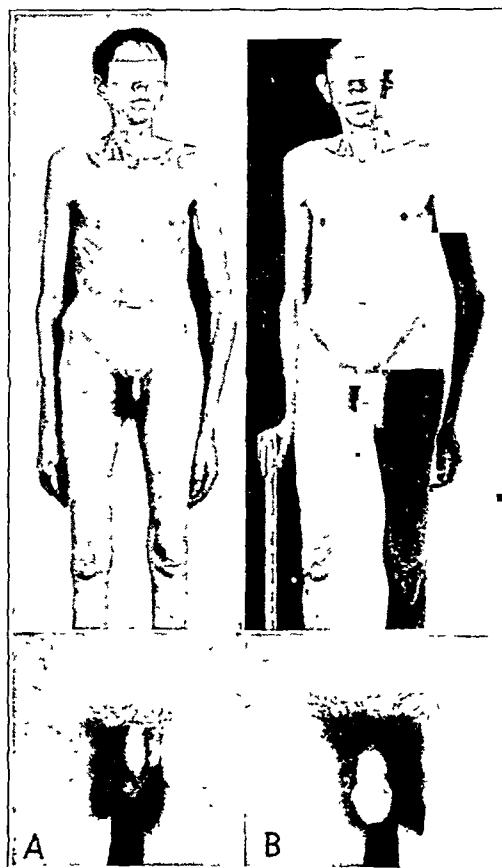


Fig. 2 (case 2).—Appearance (*A*) at beginning of treatment and (*B*) at end of eight months of treatment with daily peroral methyl testosterone.

had two seminal emissions. The nipples of his breasts became reddened and enlarged, but no breast tissue was palpable. He gained 15 pounds (6.8 Kg.) during the first month. At the end of three weeks' treatment there was a sudden appearance of acne on his face for the first time in his life, and this has persisted to date. His skin began to tan when exposed to the sun; this had never occurred before. His penis gradually enlarged and at the end of the first year it had reached 13 cm. in length when fully extended. The glans penis measured 3.7 cm. wide and the midshaft diameter was 3.3 cm. Figure 2 *B* shows the change in appearance eight months after treatment was begun. The prostate grew rapidly during the first five months of treatment until it was entirely normal in size, shape, contour and consistency. No change occurred in the voice until after several months of treatment, when it became deeper. Since treatment with methyl testosterone was begun there has been a decided increase in his general strength, but because of the removal of the gastric carcinoma we have hesitated to attribute this entirely to the drug. Dark hair has appeared over

the lower legs and forearms and there has been considerable increase in pubic hair (fig. 2B). During the past year his weight has remained the same and he has maintained the 15 pound gain which was made in the first month. No toxic symptoms whatever appeared. His wife left him several months ago, and he believes this was precipitated by the greatly increased demand for coitus on his part.

COMMENT

The results in these 2 cases are quite in accord with the several other reports which have recently appeared.¹⁷ We consider it noteworthy that our patients received treatment for twenty and one-half and seventeen and one-half months respectively. Such prolonged treatment affords more information as to the efficacy of the peroral route of administering methyl testosterone. In these 2 cases, 1 of eunuchism and the other a typical example of eunuchoidism, methyl testosterone by mouth has reproduced effects comparable to those in other cases following percutaneous administration, subcutaneous injection and pellet implantation of testosterone and its esters. There occurred considerable growth of the internal and external genitalia with great increase in sexual potentia. There was definite improvement in general strength and mental vigor. Characteristic changes involving the hair, skin, breasts and voice occurred.

We have administered methyl testosterone over short and long periods of time. Patient 1 received a total of 21,750 mg. over a period of twenty and one-half months. In the beginning it was felt that the presence of the methyl group might have altered the biologic characteristics of testosterone, and it was therefore of particular importance to study carefully all possible toxic reactions. The only evidences of toxicity were headache, diarrhea and accentuation of a cardiac irregularity in 1 case. These were all mild in character, of short duration (first two weeks of treatment), and they spontaneously disappeared without withdrawal of the drug.

When treatment was begun it was necessary to determine the optimal maintenance dosage. At first we prescribed amounts ranging from 50 to 100 mg. a day but found that these quantities produced sexual overstimulation. By trial and error methods we became convinced that 20 to 30 mg. a day gave the desired subjective and objective effects and that greater doses led to waste of hormone and excessive libido and potentia. Doses in the lower magnitude (140 to 210 mg. a week) resulted in changes in eunuchoid patients identical with those produced by 25 mg. of subcutaneous testosterone propionate twice a week (50 mg. a week). The optimal maintenance dose of peroral methyl testosterone a week is evidently three to four times that of testosterone propionate by injection. The ease of administration of the former more than compensates for the large quantity of hormone needed. A factor which tends to offset the cost of a greater amount of this drug is the reduction in the number of necessary visits to the physician's office.

The mode of action of methyl testosterone has not been conclusively explained. Testosterone, its esters and its methyl derivative have been found to be effective

to various degrees in both human beings and animals whether administered subcutaneously, by injection or by subcutaneous pellet implantation.¹⁸ Biskind and various collaborators have shown that these hormones are inactivated by the liver when absorbed through the portal circulation.¹⁹ It is of unusual interest that of all these compounds methyl testosterone is the only one which is appreciably active when given by mouth. Miescher and Tschopp⁹ believe that the methyl group in the 17 position probably protects the hydroxyl group from hydrolysis by intestinal ferments and thus the molecule is absorbed unchanged. Biskind²⁰ has suggested that the greater activity of peroral methyl testosterone may be due to the fact that it is absorbed from the intestinal tract via the lymphatics, thus reaching the general circulation without passage through the liver. In connection with absorption, it is of interest that patient 2 shows that the presence of the stomach is not necessary for assimilation and utilization of the hormone.

There has been speculation whether the activity in the body is due to methyl testosterone, its testosterone base or a further metabolite. One of us (S. A. V.), however, observed no qualitative differences in the genitalia of male monkeys receiving testosterone and its methyl derivative.²¹ It has been observed by Klein and Parkes²² that methyl testosterone exerts a more pronounced progestational effect on the rabbit uterus than testosterone. This possibly intimates that the activity may be due to methyl testosterone and not to the testosterone itself.

SUMMARY

1. Two patients, 1 a 48 year old castrate, the other a 39 year old eunuchoid, received peroral methyl testosterone for twenty and one-half and seventeen and one-half months, respectively.
2. Methyl testosterone administered by mouth was found to be effective. It produced changes in the genitalia and other sexual attributes comparable to those following subcutaneous administration of testosterone propionate.
3. The previous removal of the stomach of 1 patient did not affect the results.
4. The optimal dosage in complete or decided testicular deficiency was found to be 20 to 30 mg. daily. This is three to four times the amount of testosterone propionate necessary for proportional effects. The convenience of administration and the reduction of necessary office visits compensate greatly for the larger amount of hormone required.
5. Toxic effects in the 2 patients who received prolonged administration and in 12 other patients treated over shorter periods of time were negligible. In 1 of the 2 cases reported here an amount was administered in excess of 21,750 mg. over a period of twenty and one-half months.

18. Biskind, G. R., and Meyer, M. A.: The Comparative Androgenic Potency of Testosterone, Methyl Testosterone, and Testosterone Propionate Administered in Pellet Form, *Endocrinology* **28**: 217-221 (Feb.) 1941. Emmens and Parkes.¹⁰

19. Biskind, G. R., and Mark, Jerome: The Inactivation of Testosterone Propionate and Estrone in Rats, *Bull. Johns Hopkins Hosp.* **65**: 212-217 (Aug.) 1939. Biskind.²⁰

20. Biskind, G. R.: The Inactivation of Methyl Testosterone in Castrate Male Rats, *Proc. Soc. Exper. Biol. & Med.* **43**: 259-261 (Feb.) 1940.

21. Vest, S. A.; Drew, J. E., and Langworthy, O. R.: Implantation of Crystalline Testosterone in Monkeys, *Endocrinology* **27**: 455-460 (Sept.) 1940; Some Comparative Effects of Testosterone Derivatives in the Monkey, *ibid.* **28**: 257-262 (Feb.) 1941.

22. Klein, M., and Parkes, A. S.: The Progesterone-like Action of Testosterone and Certain Related Compounds, *Proc. Roy. Soc., London, B* **121**: 574-579 (Feb. 3) 1937.

17. Simonson, E.; Kearns, W. M., and Enzer, N.: Effect of Oral Administration of Methyl Testosterone on Fatigue in Eunuchoids and Castrates, *Endocrinology* **28**: 506-512 (March) 1941. Tager, B. N., and Shelton, E. K.: Testosterone Propionate Inunction and Methyl Testosterone Orally, *J. Clin. Endocrinol.* **1**: 131-133 (Feb.) 1941. Foss,¹¹ McCullagh,¹² Spence,¹³ Kearns.¹⁴

STREPTOCOCCI IN AIR AS AN INDICATOR OF NASOPHARYNGEAL CONTAMINATION

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With the introduction of the Wells Air Centrifuge,¹ a renewed interest has developed in the bacteriologic examination of air, particularly in reference to its streptococcal content under various environmental conditions. The studies, including some on schools, theaters, subways, railway cars, textile factories and hospitals, have been conducted largely in New York, Boston and Iowa City.² Our investigations, carried out in a department store³ which is the largest and perhaps at times the most crowded in the world, constitute an attempt to correlate the density of crowds with the degree of bacterial pollution of the air, in relation not only to total bacterial counts but especially to the numbers of streptococci of nasopharyngeal origin, to determine seasonal variations in respect to such data and to plot the prevalence rate for disabling colds among the employees in relation to the numbers of streptococci in the air during the course of a year.

The total number of employees in this store ranges from 11,000 to more than 20,000 during the holiday season. In the medical department a record is kept of the number of disabling colds involving at least one day's absence among these employees. The monthly average incidence was taken as an approximate index of the prevalence of colds among the customers of the store, and on this basis was assayed the validity of the suggestion of Wells⁴ that the prevalence of alpha streptococci in the air may serve as an index of the pollution of air by cough spray, as that of *Escherichia coli* serves in reference to the pollution of water by sewage.

The building is ventilated by mechanical methods. All fresh air inlets for the upper floors are located on the roof of the tenth floor. The air is conditioned for the basement and for the main, first, second, third and fourth floors only, with five changes per hour. However, as two thirds of the air is recirculated after it has been washed and filtered and heated or cooled and its humidity has been corrected, there are actually introduced only one and two thirds changes of fresh outside air per hour for these locations. The inlets and outlets are located on the ceilings 12 to 21 feet (3.6 to 6 meters) above the floors. For the floors above the fourth, including the corridor in the medical department, where a series of examinations were made, the air is filtered and heated in the cold months but not cooled or humidified and is changed six to twelve times, each change bringing in fresh air.

Miss Natalie Williamson gave technical assistance

From the Department of Public Health and Preventive Medicine, Cornell University Medical College, and the Macy Mutual Aid Association

1. Report of Sub Committee on Bacteriological Procedures in Air Analysis. Year Book 1936-1937, Am. J. Pub. Health (supp.) 27:1, 1937.

2. Wells, W. F., and Riley, E. C., An Investigation of the Bacterial Contamination of Air of Textile Mills with Special Reference to the Influence of Artificial Humidification, J. Indust. Hyg. & Toxicol. 19: 513, 1937. Buchbinder, Solowey and Solotorovsky, Pincus and Stern.

3. R. H. Macy & Co., Inc.

4. Wells, W. F., and Wells, M. W., Air Borne Infection, J. A. M. A. 107: 1698 (Nov. 21) 1936.

METHODS

Medium.—The culture medium was a nutrient agar prepared according to the "hormone" method.⁵ After some experimentation the following formula was adopted: water 1 liter, chopped beef heart 500 Gm., neopeptone (Difco) 10 Gm., sodium chloride 5 Gm., dextrose 3 Gm. and agar (flaked) 24 Gm.; final *p*_H 7.4 to 7.5. This amount of agar was found necessary to prevent slipping in the tubes. It produces a medium rather too stiff for optimal cultural purposes, but with the Wells air centrifuge technic this degree of stiffness is necessary. Each batch of medium was tested for capacity to promote the growth of the more delicate strains of streptococci from the air. Enrichment with human plasma, casein digest or glycerin-potato extract was not found advantageous.

Air Sampling.—About 25 cc. of the warm melted agar medium was placed in a sterile Wells centrifuge cylinder provided with a rubber stopper with a large hole loosely plugged with cotton. No sheep's blood or other blood was added to the medium, and in this respect the procedure was a deviation from the usual. The amount of blood which has been recommended,¹ although facilitating the recognition of colonies of alpha hemolytic streptococci, clouds the medium to some extent. In this study a search was made for all types of streptococci, not only those acting on red blood cells but the gamma, or "indifferent," types, and it was found that fishing of streptococcus-like colonies was facilitated if the medium was clear. As a routine procedure, however, the addition of blood is desirable.

The air centrifuge was run for ten minutes, which generally accomplished the sampling of 20 cubic feet (0.56 cubic meter) of air per culture tube or 2 standard air samples of 10 cubic feet (0.28 cubic meter). For locations where the gage indicated that a greater amount of air was sampled in this period, suitable adjustments have been made in the tables.

The culture cylinders were incubated for forty-eight hours at 35 C. before streptococcus-like colonies were fished and for an additional day or two at room temperature before the total colony counts were made. All colonies even remotely resembling those of streptococci were fished by stabbing in semisolid hormone agar. Streptococci produce a rather characteristic type of growth in this semisolid medium. Typically there occurs growth along the full length of the stab with little or no spreading at the surface from the point of entry of the stab. Cultures producing a spreading white growth on the surface, although otherwise streptococcus-like in appearance, were discarded. This procedure probably resulted in the elimination of some strains, designated as "putative" streptococci by Buchbinder, Solowey and Solotorovsky.⁶ The diphtheroid organisms, whose colonies may resemble those formed by streptococci, are much more aerophilic, as shown by a spreading surface growth and its limitation in the stab to the upper half or two thirds of the medium column. A further advantage of these stab subcultures was found in the fact that they permitted the recognition of microaerophilic strains of streptococci. The cultures were stained by the Gram method and those conforming to the streptococcus in form and reaction were streaked on rabbit blood agar plates. In the

5. Zinsser, Hans and Payne Jones, Stanhope. Textbook of Bacteriology, ed. 7, New York, D. Appleton Century Company, Inc., 1934, p. 1037.

6. Buchbinder, L., Solowey, M., and Solotorovsky, M., Alpha Hemolytic Streptococci of Air, Am. J. Pub. Health 28: 61, 1938.

absence of chain formation only gram-positive, elongated diplococci forming streptococcus-like colonies were considered streptococci.

Spreading colonies of the subtiloid type were troublesome, particularly during the warmer months, in samples of air taken on the lower floors. As the result of overgrowth a good many samples had to be discarded. Because such overgrowth occurred rarely in cultures taken in the corridor of the medical department, it seems possible that the subtiloid types were derived chiefly from the merchandise, especially the textiles. No effective way to prevent this overgrowth was found, although the early ringing of such colonies with crystal violet aided.

In table 1 are given the data on the various locations in the store where samplings of air were made, from the basement to and including the ninth floor. The samples were taken between noon and 2 o'clock during April, May and June. As has been stated, the air furnished the floors up to and including the fourth

occupancy, except as the activities of the population tended to stir up dust. Under the conditions of the department store industry, the total counts would seem to have no sanitary significance except as they reflect the efficiency of the cleaning methods employed.

On the other hand, the streptococcic counts bore some relation to the size of the crowds, as is indicated in table 1. For the locations with the larger crowds they are similar to those reported by Pincus and Stern⁷ and Buchbinder and his associates⁸ for theaters and subways but lower than those for schools. In the following section the factors influencing the number of streptococci in the air will be discussed.

As diphtheroid organisms are occasionally found in the nasopharynx and their colonies are readily recognized, counts of these were made in the general survey of the building. The percentage ranged from 0.5 to 28 of the total count, with an average for all locations of 8.5. No correlation here or elsewhere was observed between their numbers and the size of the crowds, and

TABLE 1.—Locations in Department Store: Samples of Air Taken from April to June 1938

Floor	Department	Comparative Density of Average Population	Number of Air Samples (10 Cu. Ft.)	Average Total Colony Count per Sample	Streptococci		Diphtheroid Organisms, Average Colony Count per Sample
					Average Isolations per Sample	Ratio of Alpha to Gamma Types	
Basement....	Household appliances	++++	10	190	0.9	7-2	9
Main....	General...	++++	12	226	0.66	3-1	20
Second....	Women's hats	+++	12	93	0.66	7-1	10
Third....	Women's cotton dresses	++	12	152	0.25	2-1	12
Fourth...	Boys' clothing..	+	12	90	0.59	5-2	9
Fifth...	Shoes...	+	12	153	0.25	All alpha	8
Sixth...	Notions...	++	12	210	0.42	4-1	15
Seventh..	Rugs....	+	12	153	0.08	All gamma	1*
Eighth..	Groceries..	++	12	58	0.08	All alpha	2*
Eighth...	Men's club	+++	10	51	0.66	5-1	2*
Eighth..	Cafeteria	++++	6	44	0.33	All alpha	12*
Ninth..	Furniture..	+	12	29	0.17	All alpha	2*

*Six samples of air.

is conditioned (humidified and cooled or heated), whereas that for the upper floors is fresh filtered air which is heated when necessary. The flooring is tile in the basement and on the main and eighth floors, but elsewhere it is carpeting. As to total colony counts per sample, the higher numbers occurred in the basement and on the main, third, fifth, sixth and seventh floors. As the table indicates, these numbers bore no necessary relation to the density of average population or to the type of ventilation. There seemed to be some relation to the character of the merchandise handled; that is, whether it would affect the dustiness of the air. Thus on the seventh floor there were comparatively few people and the fairly high count may have been due to the dust produced in turning rugs. On the ninth floor, where furniture is displayed, the average population is about the same as for the seventh, but the total colony count was low, presumably because the conditions were not such as would be likely to increase the dustiness of the air. In the cafeteria at the time the samples were taken the crowd was large, and yet the total bacterial colony count was low. There was, furthermore, no evidence that the total counts were influenced by the manner of ventilation. It would seem, then, that the size of these counts was influenced largely by conditions favoring the production of dust and its dispersal in the air and not primarily by human

no evidence appeared which indicated that they bore any direct relation to contamination of the air resulting from human occupancy.

CAN THE NUMBERS OF STREPTOCOCCI IN THE AIR SERVE AS A MEASURE OF POLLUTION BY HUMAN BEINGS?

Buchbinder, Solowey and Solotorovsky⁶ concluded, as a result of the comparison of alpha hemolytic streptococci isolated from the air with those obtained from throat swabs, that the "probable origin of most of the air streptococci is the human throat" and that the presence in air of alpha hemolytic streptococci indicates pollution by human beings. As has been mentioned, Wells⁹ has suggested that alpha hemolytic streptococci may serve the same role for air as *Esch. coli* for water as an index of pollution. A similar proposal, as acknowledged by Wells, was originally made by M. H. Gordon⁸ as an outcome of his bacteriologic studies carried out many years ago on the pollution of air by spray from the mouth. In figure 1 are shown curves which tend to substantiate this proposition. The curve for the monthly incidence of disabling colds among the employees is compared with the curves for (a) streptococci of all

7. Pincus, S. and Stern, A. C.: A Study of Air Pollution in New York City, Am. J. Pub. Health 27: 321, 1937.
8. Gordon, M. H.: Report on a Bacterial Test for Estimating Pollution of Air, Rep. M. Off. Local Bd., London (1902-1903) 32: 421, 1911.

types and (b) alpha streptococci for each month in a year except August. The determinations for streptococci represent the average of the findings for four locations, the basement and the main, second and fourth floors. The samples (10 cubic feet, or 0.28 cubic meter) were taken each time at the same locations, and the total number per month ranged from 21 to 68 and averaged 44. In "total streptococci" are included both alpha and gamma, or indifferent, types. It is felt that the gamma types and the few beta types recovered are as definitely related to the human throat and nasopharynx as are the alpha types. In support of this view, an examination of blood agar plates exposed to the coughs of normal persons and of those with or recovering from colds has shown indifferent streptococcal types similar to those recovered from the air, and these have been present in numbers somewhat similar to those of the alpha types (table 1), that is, the alpha outnumbered the gamma colonies up to 10 to 1, but occasionally the two types appeared in approximately equal numbers. It should be stated that our term alpha is equivalent to the term alpha hemolytic used by previous investigators.⁹

The curves for both total streptococci and alpha streptococci, particularly the former, show a striking correspondence throughout the year to that based on the prevalence of colds (number per thousand employees). All curves were low during the summer months, but with the development in October of the usual fall peak in the incidence of colds there occurred a corresponding rise in the curves for streptococci in the air. Although in December the crowds are by far the densest, the peak for streptococci in the air did not develop then but in February, when the curve for colds also reached its peak. The correspondence was particularly close in reference to total streptococci because of the fact that in January and February the gamma types in the air increased to a greater proportional degree than the alpha. The drop in the incidence of colds in March is reflected by a corresponding drop in the curves for streptococci in the air. It should be emphasized that this correspondence in the curves would not have become so apparent if the curves for streptococci had not been based on the average of the findings for all four locations.

It is of interest that microaerophilic streptococcal strains, recovered from the air, were prevalent only between January and April. The average for all locations was 14.7 per cent of the total strains, with the highest rate for the main floor, 23.7 per cent. The microaerophilic strains included both alpha and gamma types. A few strictly anaerobic strains were also found during this period and were recognized because of the routine use of stab cultures in semisolid hormone medium.

As previous reports have dealt only with alpha streptococci in the air, table 2 is inserted to facilitate comparison of the data.

9. MacDonald, Kenneth: A Quantitative Bacterial Analysis of the Air of Operating and Delivery Rooms and Related Areas, *Am. J. Hyg.* 31: 74, 1940. Wells and Wells.⁴ Buchbinder, Solowey and Solotorovskys.⁸

The average is lower than that reported by Buchbinder and his associates⁶ for schools (68 per cent) and subways (62 per cent), but the averages for the basement and the main floor closely correspond to their figure for air-conditioned theaters (32 per cent). On the other hand, these averages are much higher than that reported by MacDonald⁹ for operating rooms in a hospital (13 per cent).

The averages for total bacteria (colony) counts varied from month to month, with the highest occurring in the spring and summer and the lowest in October and November.

CORRIDOR IN MEDICAL DEPARTMENT

For comparison with the results obtained in the store, samples of air were taken in a corridor in the medical department on the nineteenth floor. This corridor, which opens through a doorway at one end into a waiting room and at the other into a corridor running at right angles, is 9 feet wide and 60 feet long (2.7 by 18.2 meters) and has an area of 6,090 cubic feet (172.3 cubic meters). The floor covering is linoleum

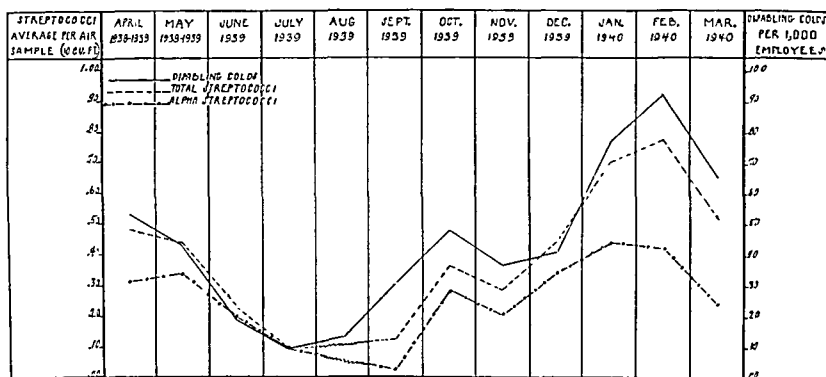


Fig. 1.—Average monthly isolations of streptococci from samples of air from four locations, compared with incidence of colds among employees.

and is washed each night and occasionally waxed. On benches on the side opposite the air centrifuge sick employees waiting for medical attention were seated and were about 9 to 20 feet (2.7 to 6 meters) distant from the air inlet of the centrifuge. Among these patients there were a varying number suffering from infections of the upper respiratory tract. A record was

TABLE 2.—Percentage of Samples (Ten Cubic Feet, or 0.28 Cubic Meter, of Air) Containing Alpha Streptococci

Location	Total Number of Samples	May 1 to November 1	November 1 to January 1	January 1 to May 1	Average
Basement.....	142	25.6	25.9	43.1	31.6
Main floor.....	175	19.9	37.1	40.3	32.4
Second floor.....	106	20.7	16.6	25.6	20.9
Fourth floor....	92	16.0	13.3	29.4	19.9

kept of the number present at the time of each sampling of air and of the total number for the day. The patients begin to arrive at 8:45 a. m. and the medical staff of about fifteen between 9 and 9:15. Samples of air were taken on Mondays at the times stated in table 3. The figures for patients state merely the average number present at the time of sampling. The average total number per day for the entire period was 229.

The mean temperature during this period, January 14 to April 4, was 74 F., and the mean relative humidity was 33 per cent. The conditions of the air were thus such that droplets emitted by coughing and sneezing would be likely to evaporate quickly, leaving the droplet nuclei of Wells.⁴

As indicated in table 3, with increasing population and activity beginning about 9 a. m. the total bacterial colony count rose to a peak at about 11 a. m. and then gradually decreased to a low point at 1:30 p. m., with another but less pronounced rise and fall in the afternoon. The curve for streptococci, shown in figure 2, followed closely that for total bacteria, except that there was no second rise in the afternoon. In figure 2 the curve for streptococci is compared with that for the average number of patients at the times of sampling. The former reached its peak about two hours after the latter. As other conditions were approximately equal, there would seem to be some indication that droplet nuclei carrying streptococci accumulated in the air during this two hour period but then decreased and did not affect the streptococcic count for the afternoon. The

opposite the benches on which the patients were seated. The lamps are claimed to give an output of ultraviolet radiation "better than 93 per cent in the one wave length 2,537 angstrom units." On the days on which the air was irradiated the lamps were in operation from one half to two hours before samples of air were taken. As the figures in table 2 indicate, this exposure apparently killed all the streptococci in the air except in 2 instances in the morning and in 1 in the afternoon. It had much less relative effect on the total counts, the reduction during the day ranging from none to 55 per cent.

Buchbinder, Solowey and Solotorovsky⁶ have reported in detail on the forms and the biochemical properties of streptococci recovered from the air in a wide variety of locations. Although our series of strains, studied by similar methods, is much smaller, it has seemed desirable to report our findings in a comparative way. Of 423 strains isolated, 31.9 per cent produced chains of moderate to considerable length in semisolid hormone agar, as compared with the 39.6 per cent obtained by these investigators for cultures growing in nutrient

TABLE 3—Bacterial Counts, Corridor of the Medical Department, Jan 14 to April 4, 1938

Time	Ultraviolet Lamps Off (8 Sampling Days)				Ultraviolet Lamps On (5 Sampling Days)				
	Average Number of Patients	Number of Air Samples (10 Cu. Ft.)	Average Bacterial Colony Count per Sample	Streptococci Isolated per Sample			Number of Air Samples	Average Total Colony Count per Sample	Streptococci Isolated per Sample
				Average	Highest	Ratio of Alpha to Gamma			
8:45 - 9 a m.	8.0	16	31	0.31	1.5	3.1	10	45	0.0
9:30 - 10 a m.	20.0	18	72	0.61	1.0	3.2	12	51	0.15
10:45 - 11:15 a m.	8.0	16	90	0.7	1.5	2.1	16	50	0.0
11:45 a m - 12 noon	5.0	16	68	0.5	2.0	All alpha	16	46	0.0
1 - 2 p m.	3.2	18	61	0.33	1.0	2.1	8	50	0.0
1:30 - 2 p m.	3.7	16	53	0.31	1.0	2.1	10	45	0.0
2:45 - 3 p m.	4.1	18	76	0.1	0.5	1.1	10	34	0.1
3:30 - 4 p m.	4.6	14	51	0.1	0.5	6.1	6	54	0.0

curves in figure 3 are based on the data on the corridor for the period from September 12 to November 14, during which 22 samples of air were cultured at each of the time periods. The average number of patients present on the sampling days was 219, approximately the same as in the winter months. The mean temperature was 1 degree higher, 75 F., and the average relative humidity considerably higher, 48 per cent. The total colony counts exhibited a fluctuation throughout the day similar to that for the cultures made during the winter months (table 3) and were only 9 per cent lower, taken as a whole. On the other hand, only about one third as many streptococci were found in the air through the greater part of the day. This finding conforms to that for the store and is similarly related to the lower incidence of colds. The general trend of the curve for streptococci was similar to that for the winter months except for a second rise in midafternoon during the fall months. This was associated with a rise in the average number of patients. As was true for the store, gamma streptococci were relatively more numerous in the air during the winter months than during the fall.

In table 3 data are also given indicating the effect of ultraviolet irradiation on the total colony counts and on the number of viable streptococci in the air. The irradiation was the output of three Hanovia Safe-T-Aire lamps on stands 6 feet (1.8 meters) high, placed about 18 feet (5.4 meters) apart along the wall of the corridor

broth. Chain-forming streptococci occurred in greater frequency in samples of air taken in the corridor of the medical department than in those from the store, the percentage being 51.1 for the corridor and 27.7 for the store. Fermentation tests were carried out on 293 strains, with essentially the same type of basal medium as that of Buchbinder and his associates, with the three

TABLE 4—Comparison of Data on Strains of Streptococci Recovered from the Air

	Buchbinder and His Associates	Torrey and Lake
Total strains . . .	1,949	292
Str. salivarius . . .	58.4	40.0
Str. mitior . . .	16.7	22.2
Str. ignavus . . .	6.6	24.3
Str. equinus . . .	9.7	6.2
Str. faecalis . . .	4.4	6.5
Nonhemolytic streptococci, I, II, III	2.7	1.0

differential carbohydrates, lactose, salicin and mannitol, employed for the Holman classification. Tests with raffinose were also made. As was the experience of these investigators, many strains from the air grew rather poorly and fermented the test substances less actively than do strains freshly isolated from the mouth. In table 4 the distribution of our strains from the air in

percentages is compared with the figures reported by Buchbinder and his associates.

The correspondence in the percentages is close in respect to *Streptococcus mitis*, *Streptococcus equinus*, *Streptococcus faecalis* and nonhemolytic streptococci. The greatest divergence is in the percentages for *Strep-*

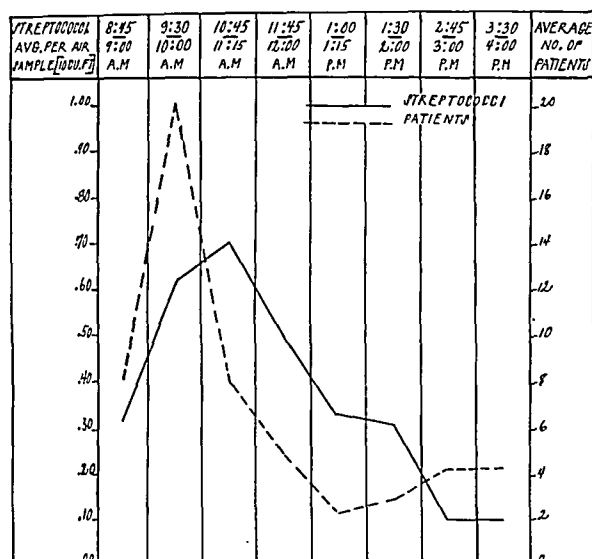


Fig. 2.—Data on streptococci isolated from samples of air in the corridor of the medical department, Sept. 12 to Nov. 14, 1938 (eleven sampling days).

Streptococcus ignavus. This difference seems principally due to the high percentage of gamma types among our strains which in fermentation tests conformed to *Str. ignavus*. Among the alpha strains alone 17.1 per cent were *Str. ignavus*, which may be compared with the 11.9 per cent for theaters and the 14.2 per cent for street air reported by Buchbinder and his associates. Safford, Sherman and Hodge¹⁰ have reported that of 322 predominant streptococci strains from normal human throats 290 constituted a homogeneous group when subjected to tests which Sherman has found of differential value in the classification of streptococci. Although on horse blood agar the reaction varied from gamma to alpha, weak alpha being characteristic, they were all considered representatives of the species *Streptococcus salivarius*, as were the remaining 32 strains which showed some variation from the type. In the light of these authors' conclusions, and although *Str. ignavus* is not mentioned, it seems probable that our strains distributed under the specific designations *salivarius*, *mitis* and *ignavus*, whether gamma or alpha in action on blood agar, may be properly designated as *salivarius*. On this basis the percentage of *Str. salivarius* recovered from the air was 86.5 as compared with the average of 83.2 per cent reported by Buchbinder and his associates on the same basis. A surprising feature of the strains recovered from the air is the relatively low percentage fermenting raffinose, 36.6 in our series and 40 reported by Buchbinder, as contrasted with 93 for pharyngeal streptococci as reported by Safford, Sherman and Hodge. Buchbinder and his associates,⁹ however, in routine cultures of material from the throat taken at a clinic found that only 50 per cent of the streptococci isolated fermented raffinose.

10. Safford, C. E.; Sherman, J. M., and Hodge, H. M.. *Streptococcus salivarius*, J. Bact. 33: 263, 1937.

COMMENT

The most interesting finding which emerged from this study was the close correlation between the curves for average prevalence of streptococci in the samples of air from four locations in the department store and those for the prevalence of colds among the thousands of employees. Obviously too few of the employees were near enough to the inlet of the centrifuge to account for the close correlation between the prevalence of streptococci in the air and the rate for colds among the whole body of employees. On the other hand, the customers so greatly outnumbered the sales force in the localities chosen that they may be accepted as the main source of pollution of the air by organisms from the respiratory tract. If it is granted that such was the case it would then follow that the rate for the prevalence of colds among the employees, as indicated by the records of the medical service, seemed to reflect strikingly the rate for colds among the general population, as is indicated in a parallel rise and fall of the two curves throughout the year. Density of crowds and prevalence of colds are the two important factors influencing pollution of the air by bacteria originating in the human respiratory tract, but of the two the latter seems to have the greater importance. During December the store is more crowded than at any other time, but the peak for the prevalence of streptococci of oral origin came two months later, when the crowds were smaller but colds most prevalent.

The relative influence of these two factors is further illustrated by the experiments conducted in the corridor of the clinic at two seasons during which the number of people to whose exhalations the air centrifuge was exposed was definitely known and approximately equal at the sampling times and the general prevalence of

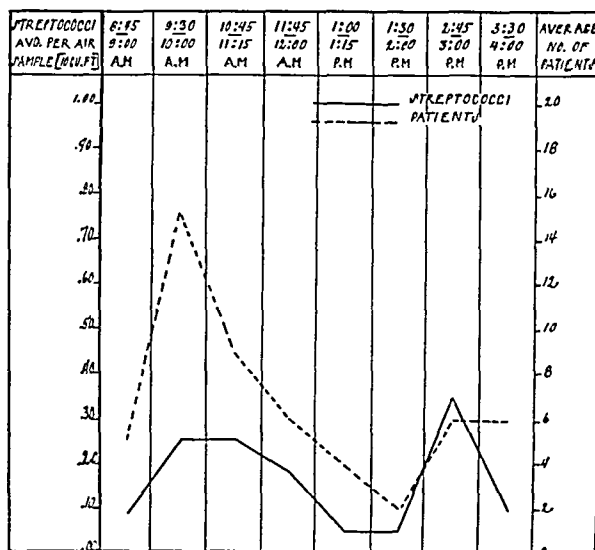


Fig. 3.—Data on streptococci isolated from samples of air in corridor of medical clinic, Jan. 14 to April 4, 1938 (fifteen sampling days).

colds was different. In the fall (fig. 3), when the incidence of colds was comparatively low, there occurred only a slight increase in the streptococci in the air with increasing numbers of persons, whereas in the winter (table 3 and fig. 2) the numbers of persons and of streptococci increased and decreased in more direct relationship. However, what proportion of these

streptococci were of immediate human origin and what proportion of remote origin, carried by dust stirred by increasing activity, cannot be stated. MacDonald,⁹ in his study of the bacterial content of the air of operating rooms in a hospital, found a positive correlation between the number of persons in a given situation and the bacterial counts for the air, both as to total numbers and as to alpha hemolytic streptococci. A similar correlation was apparent in reference to total numbers in the air of the corridor of the clinic, but, as has been explained, might or might not be observed in respect to the streptococcic content of the air, depending on the prevalence of infections of the upper respiratory tract.

As an indicator of pollution of the air by oral discharges, previous investigators have utilized the alpha hemolytic streptococcus for the good reason not only that it is the predominant streptococcic type in the oral secretions but also that its colonies are more readily recognized when growing on the sheep blood agar commonly employed in connection with the Wells air centrifuge. In this study the use of a clear medium has permitted the quantitative determination of the so-called indifferent, or gamma, types, whose colonies might not have been detected on a semiopaque blood agar lining the culture cylinders. The gamma types, it is felt, are as definitely referable to pollution of the air by cough spray as are the alpha types, and the curve for the combined alpha and gamma counts followed more closely that for the prevalence of colds than did the alpha count alone. This procedure also permitted the interesting observation that in this instance, at least, the gamma types in the air increased relatively to a greater degree when colds were particularly prevalent than did the alpha types.

SUMMARY

Bacterial analyses of the air of a large department store carried out with the Wells air centrifuge during the course of a year have shown a marked correlation between the numbers of streptococci of respiratory origin recovered from the air and the prevailing rate of colds as indicated by the medical records for the employees. This finding tends to substantiate the suggestion of Wells that the alpha hemolytic streptococcus may well be taken as an indicator of pollution of the air by nasopharyngeal discharges in a manner similar to that in which *Esch. coli* has been accepted as an indicator of pollution of water supplies by sewage.

The prevalence of streptococci and that of colds were at a minimum in the summer months. The first rise in both curves occurred in October, and then, following a drop in November, there occurred a steady rise to a peak in January and February. The streptococcic content of the air apparently was influenced to a greater proportional degree by the prevalence of colds than by the density of crowds. The store was by far the most crowded during December, yet the total count of streptococci was increased only slightly over that for October and was far lower than that for February, when the prevalence of colds reached a peak for the year. A closer parallelism in the curves for colds and for streptococci in the air was in evidence when alpha and gamma types were combined than when alpha types alone were considered. This was particularly true for January and February.

57 West Fifty-Seventh Street.

DEFLEXION ATTITUDES IN BREECH PRESENTATION

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The management of breech presentation has received considerable attention in recent obstetric literature and various plans for delivery have been described with a view to improvement in results. In these contributions, the attack on common practice has been directed against unwarranted haste, premature traction, the abuse of cesarean section and the necessity of anesthesia. All these criticisms, I believe, are on a rational basis. It has been more or less accepted by many authorities on obstetrics that breech presentation is merely a reversed cephalic presentation which can be readily turned by external manipulation, thus obviating the difficulties so often encountered during delivery. Efforts to avoid breech extraction appear to be warranted in view of the fact that the fetal mortality in delivery by breech extraction is from three to five times that by vertex extraction and has been estimated by Rulison¹ to claim 14,000 babies annually in the United States. Whether or not this figure is too high, few will deny that because of complicated deliveries and resultant mortality and morbidity breech presentation should be considered pathologic. Those who advocate routine external version have apparently given little consideration to the etiologic factors conditioning the presentation and practically none to the fetal attitude in breech.

I must disagree primarily with the opinion that breech is just a reversed cephalic presentation; I believe that it represents a deviation from the normal in that it usually combines the presence of a deflexed fetus and an abnormally shaped uterine cavity. In this communication, I wish to call attention to certain clinical features of breech presentation which have not been commonly recognized. I am of the opinion that the high mortality results from a combination of (a) the maternal complications favoring breech presentation, (b) the fetal attitude and (c) the management of the presentation—collectively. Since much has been written in the literature regarding the accepted etiologic factors and the management of breech presentation, I shall refer to these phases briefly and direct my discussion chiefly to that which has been but little mentioned, namely the deflection attitudes in breech presentation.

ETIOLOGY OF BREECH PRESENTATION

The etiology of the breech presentation is usually stated as anything which disturbs the normal utero-fetal accommodation by altering either the space in the uterine cavity or the shape of the fetal ovoid; it is divided into maternal and fetal factors. Under maternal factors one finds:

1. Abnormally developed uteri, such as arcuate, bicornuate and septate.
2. Tumors in the uterus or in the pelvis encroaching on the lower uterine segment.
3. Low lying placenta (previa).
4. Hydramnios, multiple pregnancy and other conditions causing distention of the uterine cavity.
5. Contracted pelvis.
6. Multiparity.

Read before the Section on Obstetrics and Gynecology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

1. Rulison, E. T.: *Am. J. Obst. & Gynec.* 31: 49 (Jan.) 1936.

The fetal factors are:

1. Prematurity, in which there is a relatively greater amount of liquor present.
2. Multiple pregnancy, in which there is usually an associated hydramnios.
3. A large cephalic pole, as in hydrocephalus and dolichocephalus.
4. Fetal monstrosities.

I wish to point out that the same etiologic factors are commonly encountered in transverse presentation and that deviation from cephalic to transverse or to breech presentation is but a matter of degree. The fact that in the majority of these cases the available uterine space is greater in its longitudinal axis accounts for the fact that breech occurs about six times as frequently as does transverse presentation.

For some years I have noted the frequency with which extension occurs in the breech attitude and also the relative infrequency of its occurrence in cephalic presentation, and I have speculated that this may possibly be one of the causes of breech presentation. In reviewing the literature I discovered that, while most textbooks have taken little or no notice of the etiologic role of the extended fetus, Vartan,² recently has expressed a view similar to mine. Impressed by the

lected 969 cases of breech deliveries from five London hospitals and found that in 37.3 per cent extension of the legs occurred; in multiple pregnancy and prematurity there was an incidence of 32.7 per cent, and

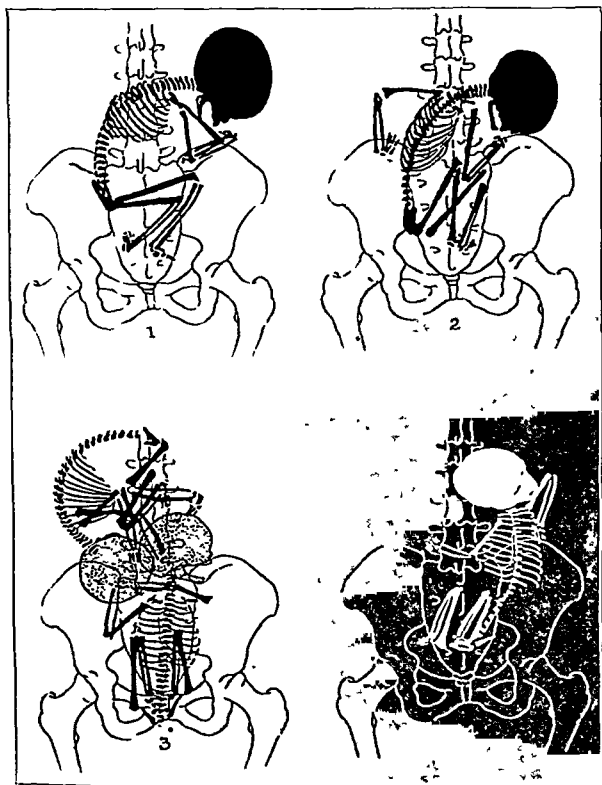


Fig. 1—Complete breech: attitude of complete flexion, full term (prone posture).

Fig. 2—Complete breech: attitude of complete flexion except for extended (displaced) left arm (prone posture).

Fig. 3—Twins: first, breech with legs flexed, spine, arms and head extended and head turned to side; second, cephalic in attitude of complete flexion (prone posture).

Fig. 4—Breech: legs flexed, spine extended, arms displaced, head rotated 90 degrees (prone posture).

fact that the usual causes ascribed to breech presentation are actually seldom found, Vartan decided to investigate the subject from clinical records. He col-

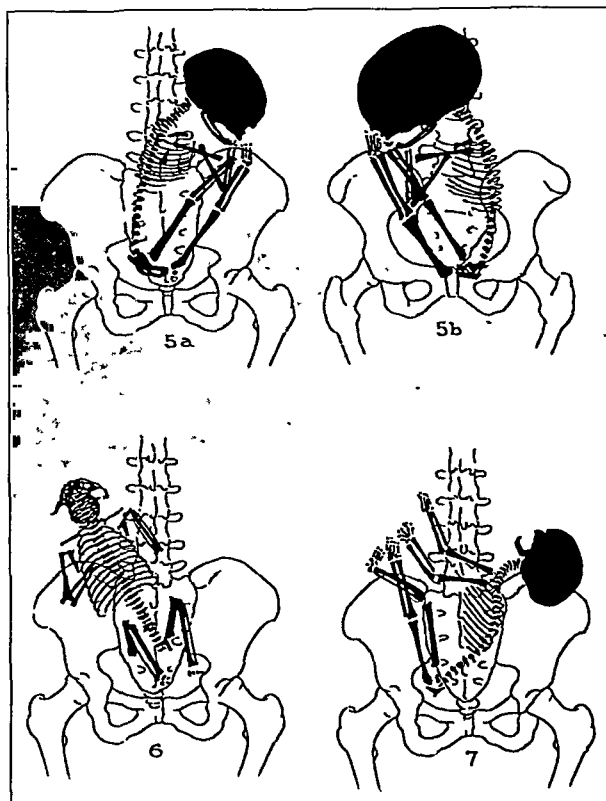


Fig. 5.—a, Frank breech: legs and spine extended; head partially deflexed (prone posture). b, Same with dorsal posture. Note distortion of fetal shadow, especially the head. (Errors in diagnosis common with this view.)

Fig. 6—Anencephalic breech: legs flexed, the spine extended (prone posture).

Fig. 7—Breech: extreme deflexion attitude similar to brow (inverted); arms and legs extended, spine deflexed, head tilted backward (prone posture).

only 4.5 per cent were associated with placenta previa and/or contracted pelvis. He believes that the fetus in the breech presentation ordinarily tends to undergo spontaneous version as term approaches and that when the breech presentation persists it is due to factors which prevent spontaneous version from taking place. Extended legs, he believes, are the chief cause for this failure. In multiple pregnancy, according to this author, the presence of more than 1 fetus in the uterus hampers the movement of each and thus becomes an important factor. He also stresses the role of prematurity, at which stage breech presentation is naturally more frequent than at term. He likewise feels that the additional factors usually attributed to the causes of breech presentation are of little etiologic significance. His data were obtained entirely from case histories, and no mention is made in his article of any roentgen studies in these cases. My observations and deductions are based on examination of roentgenograms taken in late pregnancy and in the first stage of labor.

Nandi³ adds "habitual breech" to the list of causes. In 50 per cent of cases of this type, none of the usual factors said to cause this presentation were present. He cites numerous cases from the literature since Dahlem's first report in 1886 of habitual breech of

2. Vartan, C. K.: *Lancet* 1: 595 (March 30) 1940

3. Nandi, Gerchand: *Calcutta M J* 31: 289 (Dec) 1936

from three to seven repeated breech deliveries by the same women. Nandi believes that habitual breech presentation is a distinct clinical entity in which there may be an individual hereditary tendency.

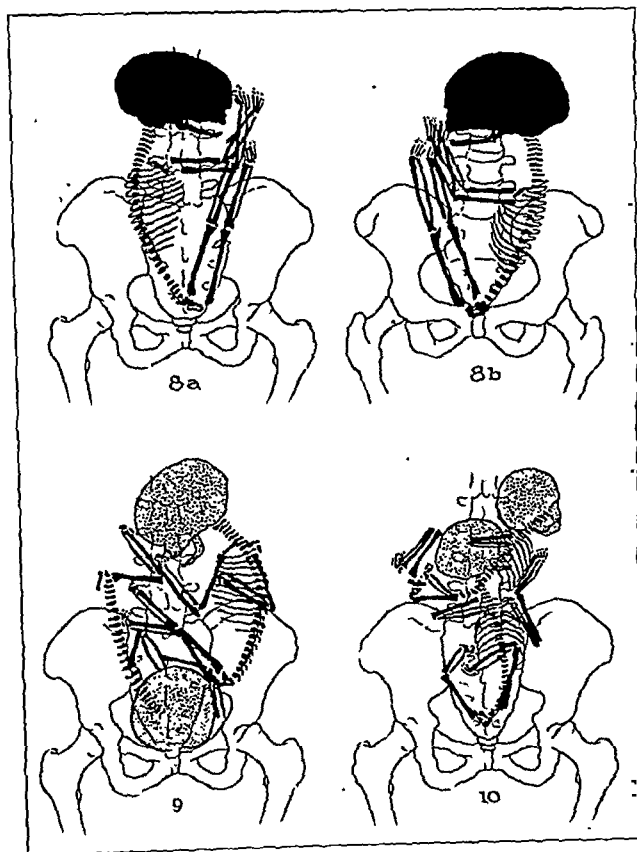


Fig. 8.—*a*, Frank breech: legs, arms, spine and head extended (prone posture). *b*, Same, with dorsal posture.

Fig. 9.—Twins: cephalic and frank breech; legs and spine extended (prone posture).

Fig. 10.—Twins: both breech; legs flexed, spines extended, heads extended and rotated (prone posture).

VARIETIES OF BREECH PRESENTATION

Breech presentation is classified as complete and incomplete. Complete breech presentation is one in which the fetus is completely flexed and the buttocks and feet present together. Ordinarily, a complete breech presentation is found under conditions which are more nearly those in cephalic presentation except that the head is in the fundus, presumably because it is not well adapted to the lower uterine segment. It is a matter of clinical observation that when the fetus remains well flexed, as in complete breech attitude, the underlying causes for this presentation do not usually interfere with the normal mechanism and spontaneous delivery. Even with attitudes of flexion in breech presentation, one sees in roentgenograms that variations frequently occur; the head is often turned to the side and one or both arms are somewhat extended. Incomplete breech presentation includes:

1. Frank breech presentation, in which the legs are extended along the trunk, the spinal column is straightened and the head is erect, as in military attitude.
2. Footling presentation, in which one or both feet present in advance of the buttocks, owing to extension of the leg.
3. Knee presentation, in which one or both knees present owing to extension of the thighs and flexion of the legs.
4. Extension of the arms.
5. Extreme deflexion attitude—as an inverse brow presentation.

Note that all the latter included under incomplete breech presentation are varieties of deflexion attitudes comparable to the deflexion attitudes in cephalic presentation, a group considered distinctly pathologic. In this variety, one more often finds the etiologic factors such as uterine anomalies, hydramnios and the like, which so alter the uterine cavity that either the fetus has greater mobility than usual, and thus extends, or it fits the uterine cavity in the extended attitude more comfortably than in flexion.

An analysis of roentgenograms taken during late pregnancy and in the first stage of labor over the past several years reveals the fact that in cases of breech presentation the deflexion attitude is the rule rather than the exception. In cephalic presentation, deflexion occurs in a small percentage of cases. Many obstetricians concur with Williams' ⁴ statement that the mechanism of labor is the same in the different varieties of breech, but this is indeed questionable. It has been my observation that dystocia occurs in cases of deflexion, whereas the well flexed complete breech presentation follows the normal mechanism and usually delivers spontaneously.

RADIOLOGIC FINDINGS

Examination of a series of roentgenograms reveals that, while complete flexion usually obtains in cases in which the fetus presents by vertex, this is not usual

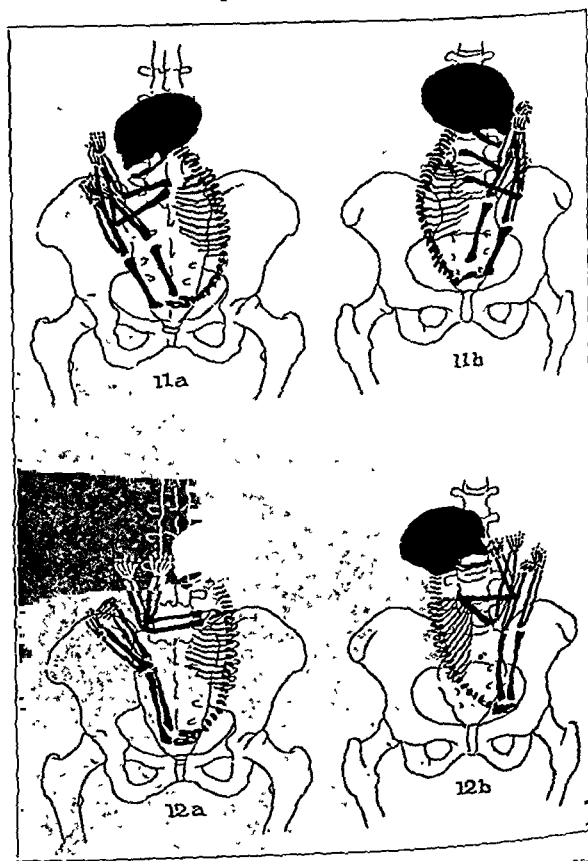


Fig. 11.—*a*, Frank breech: legs, arms and spine extended (prone posture). *b*, Same, with dorsal posture. Note distortion of fetal shadow.

Fig. 12.—*a*, Frank breech: legs, arms, spine and head extended (prone posture). *b*, Same, with dorsal posture.

with breech presentation. I have observed that incomplete breech presentation is the rule, that the legs are usually extended and that often there is additional

evidence of deflexion. The spine is usually straight, particularly in the lower half, and the head is shown to be especially mobile. This is evidenced not only by the frequent occurrence of extension but rotation and

Warnekros,⁵ in his atlas of obstetric roentgenograms published in 1918, called attention to the straightening of the spine and deflexion of the head during the first stage of labor in cases of breech presentation. This he attributed to the effect of uterine contractions on the fetal ovoid after rupture of the membrane. Similar observations, however, have been observed by me during pregnancy in which membranes were intact, and even in the presence of hydramnios. Therefore, I believe that the deflexion is primary and is not produced by contractions of the uterus.

Interpretation of the fetal roentgenogram must be made with great care in order that errors may be avoided. In 1923, Arens and I⁶ first called attention to the danger of mistaking a normal breech fetus for one with hydrocephalus because of distortion of the shadow of the head on the anteroposterior film. We advised at that time that such an error could be obviated by taking both dorsal and prone views and subsequently comparing the findings. Recently, Dippel and King⁷ described a case similar to that which we reported in which the same error was made. They discussed at length the means of avoiding repetition of such errors in future cases.

The accompanying illustrations show clearly the advantage of comparing films taken in both dorsal and prone postures. Distortion is proportionate to the distance from the film of the object under examination. Hence, the prone posture usually gives a more accurate fetal picture, and the dorsal is more likely to exaggerate certain fetal parts, especially the head lying anteriorly in the fundus. In many instances, the addition of a lateral view will aid in accurately delineating the fetal outline.

MANAGEMENT OF BREECH PRESENTATION

The term breech delivery implies a spontaneous process in which no interference is required except the usual manual aid for the arms and head; this is comparable to spontaneous cephalic delivery. Breech extraction is an operative procedure in which traction is made on the fetal buttocks or legs, followed by extraction of the arms and head and is comparable to forceps extraction in cases of cephalic presentation. Incomplete breech presentation, like the deflexion attitude of cephalic presentation, calls for extraction more frequently than the complete breech presentation for the following reasons: 1. The membranes are likely to rupture early, owing to late engagement and the incomplete filling of the lower uterine segment by the irregular buttocks; this also favors prolapse of the cord. 2. The breech is frequently arrested in midpelvis because it forms a rigid wedge instead of a flexible ovoid. This is due to splinting of the trunk by the extended legs, lateral flexion of the trunk being thus inhibited. 3. Displaced and nuchal arms cause delay and difficulty in delivery of the shoulders; arms that are extended before or during labor are not likely to become flexed spontaneously during delivery. 4. An extended after-coming head may become more deflexed during the process of extraction and thus render aid more difficult.

The physician is usually unable to determine the extent of the deflexion of the fetus by ordinary clinical means. One occasionally may palpate the extended legs on the trunk and even recognize a foot in the

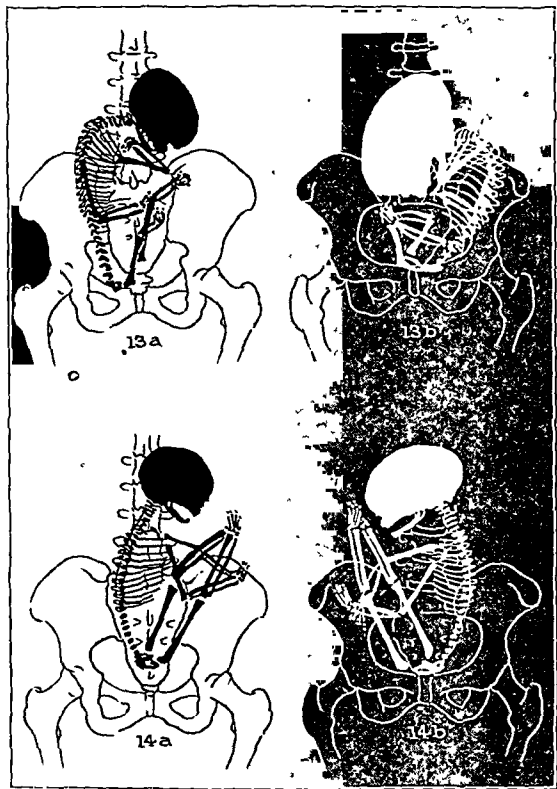


Fig. 13.—*a*, Complete breech: complete flexion except for one leg and caudal portion of spine (prone posture). *b*, Same, with dorsal posture. Note distortion of head simulating hydrocephalus.

Fig. 14.—*a*, Frank breech: extension of legs, arms, spine and head (prone posture). *b*, Same, with dorsal posture.

asynclitism as well. The displacement of the head is often of a degree rarely observed in cases of cephalic presentation. In many cases the head is turned so that the face points toward one shoulder and is sometimes tilted as well. The roentgenogram reveals that in the incomplete breech attitude the arms are rarely well flexed and crossed closely on the chest; they have been observed in various locations: with the hands in front of the face or one or both arms extended along the trunk. Even in cases of complete breech presentation extension of one or both arms has been noted, as in figure 1, in which the elbow was extended with the hand apparently resting on the side of the chest. An extended arm is also occasionally seen in roentgenograms of vertex presentation, in which the fetus is otherwise well flexed, but this finding is rare as compared to its occurrence in cases of breech presentation.

No statistical summary of these observations is presented here, nor will an attempt be made to estimate the percentage of deflexion attitudes in breech presentation, since routine roentgenography was not carried out. While I feel that it would be desirable to have roentgenograms made in all cases of breech presentation, the economic factor often makes such a procedure prohibitive. However, a large number of films taken in late pregnancy and the first stage of labor has been examined over a score of years and illustrates the prevalence of the deflexed fetus—a finding contrary to the usual impression given by textbooks on obstetrics.

5. Warnekros, Kurt. *Pregnancy and Labor in Roentgenograms*, Berlin, 1918.

6. Stein, J. F., and Arens, R. A.: *Roentgenograms of Fetal Skeleton as Positive Sign of Pregn. rev.*, J. A. M. A. 81:4 (July 7) 1923.

7. Dippel, A. L., and King, A. B.: *Am. J. Obst. & Gynec.* 28: 1047 (Dec) 1939.

uterine fundus along with the head, but in most instances the precise attitude of the fetus cannot be definitely determined except by roentgenograms. When the diagnosis of complete or incomplete breech has been established, corroborated by the roentgenograms, the question arises as to whether there should be any difference in the treatment of the two varieties. It is a matter of experience that those who favor external version of breech in late pregnancy have found that such a procedure may be readily accomplished when the fetus is well flexed. However, the fetus is likely to return to its original position owing to the fact that it adapts itself more comfortably to the available space in this presentation.

When the fetus is primarily deflexed, external version is difficult to perform and often fails altogether; furthermore, manipulation may increase the deflexion

are made for extraction in the second stage of labor. Noting the extended legs of frank breech presentation, one may anticipate that labor will progress normally until the breech reaches midplane, at which point arrest usually occurs. Normal mechanism no longer follows. Such arrest does not always require extraction in multiparas, but it usually does in primiparas. Traction on the buttocks must be made unless it is found that the breech is movable in the pelvis and can be sufficiently displaced to bring down one or both legs. The latter procedure will greatly facilitate delivery. The employment of forceps is not applicable to the breech. Traction is made by a finger in the anterior groin or on the legs. When it has been seen in the roentgenogram that the arms are displaced from the fetal trunk, extending along the body or upward over the head, one may not expect that they will be spontaneously flexed and crossed on

the chest; therefore it is advisable to avoid traction on the fetal trunk until the arms have been replaced by the internal hand. It is unwise to attempt delivery of the shoulders in the presence of extended arms, and under no conditions should an attempt be made to deliver the after-coming head until the arms are delivered outside the vulva. Furthermore, I believe it unwise to make pressure on the uterine fundus during delivery of the trunk, as advocated by some, because pressure of the head on the shoulders may cause the arms to become displaced outward, and subsequently over the head. Such pressure should be applied only after the arms have been delivered and the head has been deliberately flexed. It is obvious that if the head is primarily deflexed one should first produce flexion—by the insertion of one or two fingers of the internal hand in the fetal mouth; otherwise the head may be arrested above the inlet by the chin against the promontory or behind the pubis. Therefore, before an attempt is made to impress the head into the inlet by applying pressure above the pubis with the external hand, it is essential that flexion of the head be assured. Unless the head is well flexed, the baby may be lost because of misdirected traction. However, when the head has

been led into the pelvis in flexion, extraction is expedited and delivery may be completed either by the usual manual maneuvers or with the aid of forceps.

SUMMARY

Frank breech is the most frequent variety of breech presentation. It may be, as Vartan² states, that the extended legs prevent internal spontaneous version, thus causing the presentation. The extent of deflexion is often unrecognized unless a roentgen examination is made. The fetus in deflexion attitude seldom responds to external version and is most likely to demand extraction.

Careful scrutiny of roentgenograms to determine the extent and degree of deflexion, not only of the leg-

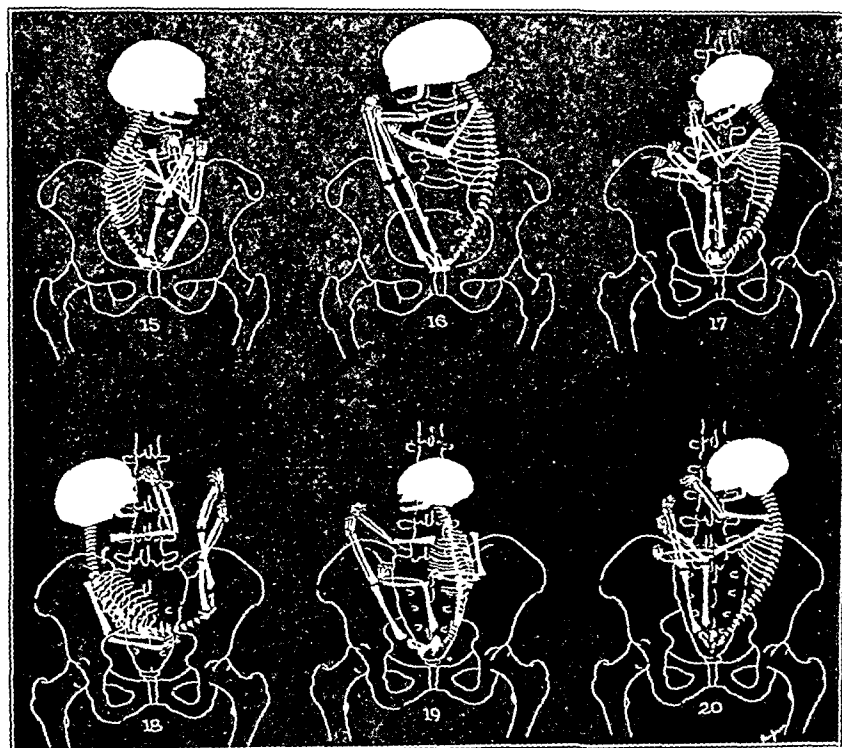


Fig 15—Frank breech legs and head extended, magnification of head shadow suggested diagnosis of hydrocephalus, normal fetus delivered (dorsal posture)
Fig 16—Frank breech legs, arms, spine and dolichocephalic head extended (dorsal posture).
Fig 17—Frank breech legs, spine and head deflexed (prone posture)
Fig 18—Frank breech pronounced deflexion of legs, arms and head, breech in iliac fossa as in oblique presentation, delivered as frank breech
Fig 19—Frank breech one leg and one arm deflexed, spine straight and head deflexed (prone posture)
Fig 20—Frank breech legs and arms extended, spine and head deflexed (prone posture).

of the fetus and may cause premature rupture of the membranes and prolapse of the cord. It is for these reasons, I believe, that external version is contraindicated in the presence of deflexion attitudes. In my own practice, I rarely perform external version in breech presentation, since I feel that when the fetus adapts itself to this position one should plan to deliver it by breech.

When one finds that the breech is well flexed, one should anticipate spontaneous delivery, and, except in those cases in which there is a definite disproportion, it usually occurs. When, after clinical and roentgen study an incomplete breech presentation is found, the extent and degree of deflexion is carefully considered in the light of probable complications, and preparations

but of the trunk, arms and head as well, will prove of great value in anticipating the difficulties which may be encountered. The roentgenograms must be accurately interpreted to avoid errors.

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ABSTRACT OF DISCUSSION

DR. HAROLD HENDERSON, Detroit: This paper emphasizes a fact which we have all realized for many years. The deflected breech favors dystocia because it fits the birth canal poorly and because it may occur in contracted pelvis as well as in abnormally shaped uteri. The complete breech, on the other hand, follows a mechanism which closely approximates the normal. I seldom do external version for the reason that, in cases in which the polarity can be changed easily, flexion is complete and a relatively simple delivery may be expected. Not only is the frank breech difficult to turn, but damage may be done in the attempt. In a series of two hundred and twenty personal breech deliveries, approximately 75 per cent were deflexion attitudes. Since these cases were not checked routinely by roentgen examination, deflexion of the head and abnormal position of the arms do not enter into this percentage. Three fourths of the series were delivered by breech extraction, a percentage that is considered radical by some authorities and defended by others. In this series there was one delivery death and another in which a premature infant of 4 pounds died because of prolapsed cord. All other deaths were due to prematurity, placenta previa, abruptio placentae, monstrosity or some other cause not connected with the error in polarity. Goethals reports a corrected mortality of 6.9 per cent, Seeley and Siddal 6.5 per cent, Danforth and Galloway 5.85 per cent, and the Chicago Maternity Center 6.6 per cent. These patients, however, were delivered by interns, residents and a cross section of the hospital staff. Hansen of Lincoln, Neb., on the other hand, reports a corrected mortality of 0.8 per cent in a personal series. No other class of cases emphasizes the difference between the expert and the occasional operator, and all hospitals should insist that the primiparous breech requires consultation. In a recent unpublished five year review of the breech cases in a large general hospital, it was found that five times as many babies were lost through delivery by the untrained man as compared to the trained obstetrician. The danger of the breech position can be minimized by proper attention to the technic of delivery and by recognition of the fact that most breeches are complicated by deflexion attitudes. About one out of sixteen babies, as reported by our best clinics, die as a result of delivery by breech. This is truly an indictment of obstetric art. Recognition of the difficulty and improvement in our technic can do far more than external version in reducing the death rate.

DR. JOSEPH B. DE LEE, Chicago: I should like to call attention to the possibility of error in interpreting roentgenograms. The distortion of the head produced by the roentgen ray is not alone in the enlargement but also in the lengthening, depending on the position which the head happens to occupy in the field of the x-ray tube. One of the factors in creating the various fetal attitudes in cephalic as well as breech presentations is the shape of the fetal head. We distinguish two main classes: brachycephalus, short heads; dolichocephalus, long heads. Flexion takes place best in long heads, because the head levers are best differentiated, a long and a short lever existing. After either head, long or short, has become somewhat fixed, either in breech or in head presentation, the forces of pregnancy, the mechanical forces of pregnancy or of labor, tend to mold it in this attitude; thus in breech presentation the deflexion shown by Dr. Stein tends to become permanent, and the top of the head is flattened by the fundus of the uterus. When a round or a short head tries to enter the pelvis, if the conditions of the lower uterine segment do not favor flexion, or the shape of the pelvis favors deflexion, we are likely to have occipitoposterior positions and deflexion attitudes, even the extreme face presentation. Then too a dolichocephalus will favor extension when the head levers are not balanced properly. These deflexion attitudes, then, in dolichocephalus, depend on the factors which favor or disfavor the functions going on in labor. I disagree with Dr. Stein and Dr. Henderson regarding external version.

I think that it ought to be widely practiced and widely recommended. Most of the breech presentations are not in the hands of Dr. Stein and Dr. Henderson and other specialists in obstetrics but are in the hands of the general practitioner, and the mortality in breech presentations with less skilful practitioners is high; if the mortality isn't so high, the damage to the baby's brain is high. Therefore I would recommend a mild, a gentle attempt to transform all breech presentations into head presentations before labor begins.

DR. EUCLID T. GADDY, Indianapolis: I have developed a simple method of external version which does not injure the fetus. About a week before the patient is due, I have the patient get in the knee-chest position. That takes the weight of the baby off the backbone and the pelvis. Then the physician can readily put one hand on the head and one on the pelvis of the fetus and make an external version in a very simple manner, and then when the patient arises the baby will stay in that position.

PAIN CAUSED BY DISEASE INVOLVING THE SENSORY NERVE ROOTS (ROOT PAIN)

ITS CHARACTERISTICS AND THE MECHANICS OF ITS PRODUCTION

L. MCKENDREE EATON, M.D.

ROCHESTER, MINN.

Pain resulting from disease involving the sensory roots of the spinal nerves is frequently encountered in neurologic practice. The diagnoses made in 100 consecutive cases of root pain that I have observed attest the importance of the disease processes which produce this symptom. It is gratifying to note that in the majority of cases the pain is the result of protruded intervertebral disks or extramedullary tumors of the spinal cord, conditions in which brilliant therapeutic results are obtained in most instances.

I realize that radicular pain is not frequently encountered by physicians who are not neurologists, yet this condition must be considered in the differential diagnosis of a host of ordinary diseases. Fortunately, root pain has characteristics as definite as the pain of angina pectoris, pleurisy, peptic ulcer, arthritis and biliary colic, with which it is sometimes confused. The recognition of the characteristics of root pain directs the clinical search to the true seat of the disease and makes for gratifying therapeutic results. Unfortunately, these characteristics are not generally recognized. It is my purpose in this paper, therefore, to describe the outstanding characteristics of root pain which are valuable in differential diagnosis and to emphasize these characteristics by considering the mechanics of the production of the pain. In so doing I shall incorporate the evidence of a few clinical observations bearing on the problem. I shall not attempt a detailed consideration of the diagnosis of those lesions which manifest themselves by root pain, as the technic for elucidating the significance of radicular pain is available elsewhere.

CHARACTERISTIC DISTRIBUTION

Root pain is referred to the cutaneous areas supplied by the affected nerve roots (dermatomes). If numerous roots are involved, as occurs in carcinomatosis of the meninges, the pain is widely distributed. However, these diseases cause little diagnostic confusion because of the prominence of the associated symptoms. The root pain produced by tumors of the spinal cord or herniated intervertebral disks, however, is localized to

one, or at most only a few, nerve roots. Of the localized lesions, those of the cauda equina are likely to involve the greatest number of roots. The cutaneous distribution of the individual nerve roots has been carefully charted by Sherrington and others, and the illustrations in the textbooks of anatomy and neurology are useful aids in determining whether or not the pain under

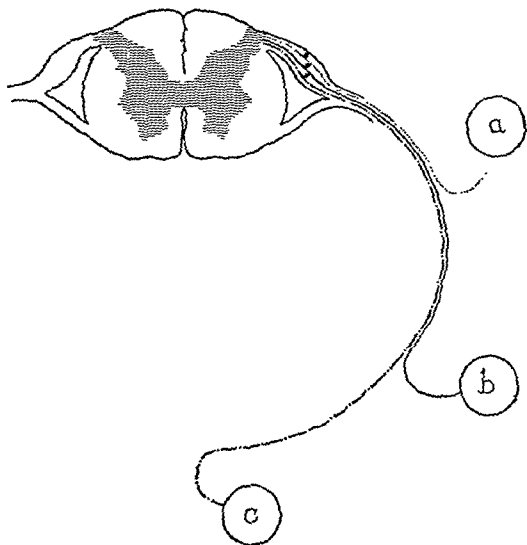


Fig. 1.—Groups of pain fibers in the sensory nerve root represented as single fibers to illustrate how incomplete involvement of the sensory root may produce pain in a localized part of the total region supplied by the diseased root. For example, pain may be referred to area a if fibers represented by the dotted line are involved in the sensory root, while fibers represented by the solid and broken lines escape.

investigation follows the distribution of a particular nerve root. The charts of Foerster are probably the most reliable.

Frequently pain is localized in a small part of the total region supplied by the affected root (case 1).

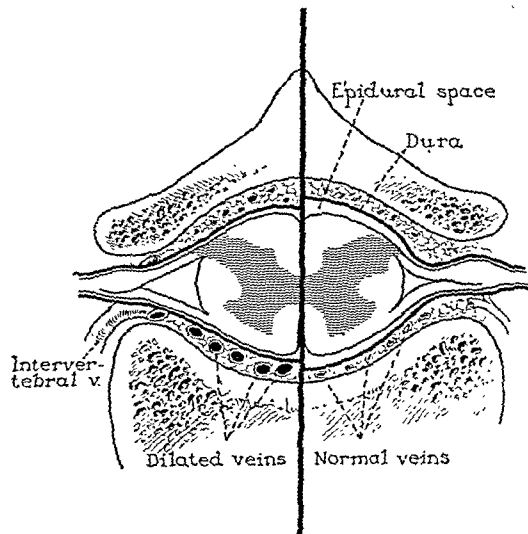


Fig. 2.—Drawing showing how root pain is produced by dilated veins of the epidural space secondary to increased intra-abdominal and intrathoracic pressure, such as occurs in coughing and sneezing and straining. The right half of the drawing represents the relationships at rest; the left half, while the epidural veins are engorged secondary to coughing, sneezing or straining.

Failure to comprehend this fact has led to much diagnostic confusion. To explain this, one may use the theory of incomplete involvement of the nerve root (fig. 1). If all the pain fibers of all the root filaments which make up the sensory root are equally involved, the pain should be projected throughout the total region

supplied by the root. For example, if the fourth thoracic root is completely involved on one side, the pain should extend around the thorax to the sternum at the level of the nipple. However, if only those fibers supplying the thorax anteriorly or the axilla or the interscapular region are sufficiently diseased to give rise to pain, it will be referred to the respective regions supplied by the localized group of pain fibers in the sensory root.

EFFECT OF A SUDDEN INCREASE IN THE INTRA-ABDOMINAL AND INTRATHORACIC PRESSURE

A characteristic of root pain which is valuable in differential diagnosis is the tendency for it to be produced or intensified by coughing, sneezing, heavy lifting or straining, as in defecation. All these acts have in common a sudden increase in intra-abdominal or intrathoracic pressure. A brief review of the anatomy of the epidural space is of value in understanding the relationship of spinal pain to intra-abdominal and intrathoracic pressure. Between the dura mater and the bone and ligaments which make up the walls of the spinal

Diagnosis of Cause of Root Pain in One Hundred Consecutive Cases

Diagnosis verified:	Cases
Protrusion of one or more intervertebral disks	53
In the lumbar region	1
In the cervical region	1
Tumors of the spinal cord:	
Meningioma	2
Neurofibroma	2
Ependymoma	1
Glioma	1
Chordoma (in cervical region)	1
Epidermoid	1
Sarcoma	2
Metastatic carcinoma	2
Pathologic fracture of one or more vertebrae	1
Spondylitis	1
Radiculitis and arachnoiditis (verified at operation)	1
Post-traumatic spondylitis	1
Fracture of one or more cervical vertebrae	1
Spondylolisthesis with hypertrophy of ligamentum flavum	1
Pott's disease	1
Subarachnoid hemorrhage (in caudal region)	1
Diagnosis not verified:	
Protrusion of one or more intervertebral disks (very probable)	8
Radiculitis (very probable)	4
Leukemia (pain in leg may have been due to other causes)	1
Diagnosis uncertain	13
Total	100

canal lies the epidural space (fig. 2). This space is composed of loose connective tissue and blood vessels. The veins in this space are directly continuous with the veins in the retroperitoneal and retropleural spaces by way of the intervertebral veins. If the intra-abdominal and intrathoracic pressure is increased sufficiently, as in coughing, the veins surrounding these cavities are collapsed and the flow of blood from the intervertebral veins is impeded. Thus the veins of the epidural space are distended, the dura is displaced toward the spinal cord and traction is produced on the nerve roots which are fixed in the extraspinal tissue and enveloped by the dura. The nerve roots may even be compressed by the distended veins surrounding them. Although this traction or compression of normal nerve roots is insufficient to produce pain, it commonly does so if the root is diseased.

EFFECT OF STRETCHING THE NERVE ROOTS

Another characteristic of root pain is the production or intensification of pain by any maneuver which stretches the nerve root. Bending the neck so that the chin rests far forward on the thorax, stooping over without bending the knees, straight leg raising when lying on the back, or extension of the leg while the

thigh is flexed on the abdomen, as in testing for Lasègue's sign, are maneuvers which frequently indicate the root character of the pain under investigation by intensifying or reproducing it. To understand the mechanics of these characteristics of root pain, it is necessary to remember that the nerve roots are firmly attached to the spinal cord and that the spinal cord

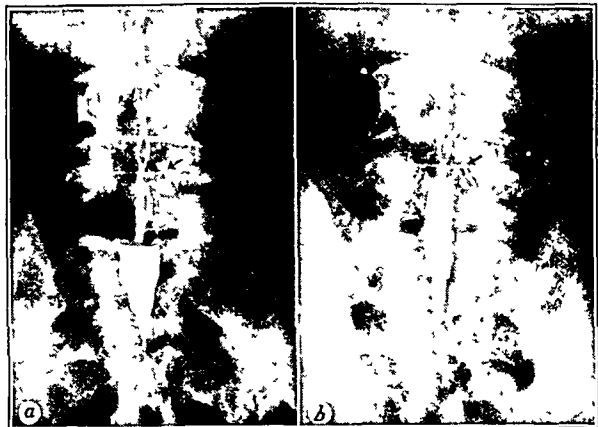


Fig 3—*a*, iodized oil filling dural cul-de-sac as the patient stands at rest; *b*, while the patient was straining, this shows how the dural sac is compressed by engorgement of veins in epidural space

is firmly anchored to the brain through the brain stem. Furthermore, the nerve roots course caudally and laterally from the lower cervical, thoracic and lumbosacral segments of the spinal cord to emerge from the spinal canal through their respective intervertebral foramina. Flexion of the neck causes the spinal cord to be slightly displaced upward; this tenses the nerve roots, which are fixed peripherally in the extraspinal tissue, and thereby produces pain in the region supplied by the diseased roots.

This is often of particular value in distinguishing pains of extraspinal origin. For instance, it is often hard to tell whether a given pain in the distribution of the sciatic nerve is due to sacroiliac arthritis or to an intraspinal lesion such as protrusion of an intervertebral disk. If bending the neck so that the chin rests far forward on the thorax, while the lower part of the back is immobilized by support in a chair, definitely intensifies the pain, one should suspect that the origin of the pain is intraspinal.

Stooping forward without bending the knees, straight leg raising, and extending the knee when the hip is flexed on the abdomen are maneuvers which tense the roots of the cauda equina and produce pain in roots that are diseased.

At times root pain will be reproduced or intensified by compression of the jugular veins. Such intensification usually signifies that the pain is caused by such a lesion as a tumor of the spinal cord which is large enough to produce complete or partial spinal subarachnoid block. Consequently, on compressing the jugular veins, one interferes with the venous drainage of the brain, the intracranial veins are distended, and the intracranial pressure is increased and transmitted through the spinal fluid, causing downward dislocation of the tumor with traction or compression of the diseased root which results in pain.

Another characteristic of root pain is its onset at night during sleep and its subsequent relief on getting up and walking about. The spinal column tends to shorten during the day, owing to compression of the

intervertebral disk by the weight of the body being carried in the upright position. In the horizontal position, during sleep, the spinal column gradually lengthens. Consequently a slight change in the relationship of the length of the spinal cord and its roots to the surrounding bony structure results. This stretches the nerve roots slightly. Often a patient with such night pain will say that he has learned to avoid or to alleviate the pain by sitting up in a chair to sleep. This characteristic of root pain is not so frequently observed as others but, when present, is of the utmost significance.

EXPERIMENTAL EVIDENCE

Since at least two of the concepts which I have mentioned are contrary to generally accepted theories, I shall mention clinical observations to support my contentions.

First, I have said that dilatation of veins in the epidural space, with coughing, sneezing and straining, dislocates the dura toward the spinal cord, stretches the enveloped nerve roots and thus produces pain. It has generally been assumed that such intensification of pain results from an increase in pressure of the spinal fluid. However, as I observed that jugular compression very rarely intensified root pain, unless the pain was due to a tumor of the spinal cord which produced dynamic subarachnoid block, I sought another explanation.

A young man who had pain along the distribution of the sciatic nerve which was intensified by placing the head forward on the thorax, by the Lasègue maneuver, by stooping forward and by coughing, sneezing and straining at stool was found to have a typical protrusion of the lumbosacral disk. Surgical removal of this disk relieved the pain. Three days prior to operation, two spinal puncture needles were inserted into the spinal subarachnoid space in the usual manner, one at the third and the other at the fourth lumbar interspace. A

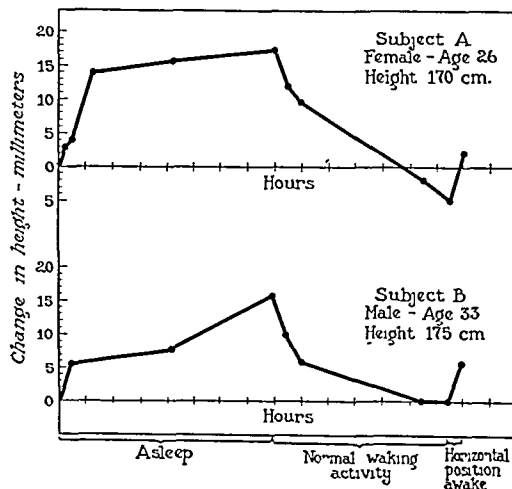


Fig 4—Variations in height of two subjects engaged in normal activities during a period of fifteen hours

water manometer was attached to the needle at the higher level. Flexing the head forward on the thorax until the pain was intensified caused the spinal pressure to rise to 29 cm. from an initial pressure of 7.2 cm. of water. However, with the head in the rest position the pressure rose to 30 cm. on compression of the jugular veins without intensifying the sciatic pain. This demonstrated that the intensification was not due to the increase in intraspinal pressure itself. On coughing,

the spinal pressure rose to 16 cm. and the pain was intensified. When physiologic solution of sodium chloride was injected rapidly into the spinal subarachnoid space through the lower needle, the pressure was elevated to 25 cm. without intensifying the pain. The pressure was then lowered to 16 cm. by allowing fluid to escape through the lower needle, which was slowly withdrawn until the flow of fluid ceased. The tip of the needle was then in the epidural space. Forty cc. of physiologic solution of sodium chloride was then slowly injected into the epidural space. This greatly intensified the pain but raised the pressure of the spinal fluid to only 28 cm.

These observations support the theory that increasing the pressure of the spinal fluid alone does not intensify root pain. Increasing the size of the epidural space, with consequent displacement of the dura toward the spinal cord, is the factor responsible for intensification of the pain by virtue of traction on the diseased nerve roots.

Graphic proof of the fact that straining increases the size of the epidural space at the expense of the intradural space can be seen in figure 3. Figure 3a shows the iodized oil filling the lower end of the caudal sac as the patient stands relaxed. Figure 3b shows a roentgenogram that was made a few minutes later, while the patient strained vigorously in the upright position. Owing to increase in the size of the epidural space, the intradural diameter is decidedly narrowed and the shadow produced by the iodized oil becomes longer and narrower. Exactly the reverse would occur if increased intradural pressure played the predominant role; that is, the column of iodized oil would become shorter and broader. The arrow points to oil in the perineural spaces of a nerve root. In the original roentgenograms it can be readily seen that the nerve root is displaced medially with straining.

The intensification of root pain at night frequently has been attributed to nocturnal increase in intraspinal pressure. A more likely factor seemed related to the known fact that the spinal column is elongated when one lies down. For five successive days, two subjects were measured at night on retiring and in the morning on arising. Subject A, a woman 26 years old and approximately 170 cm. tall, showed an average gain of 20.2 mm. in height during sleep. Subject B, a man 33 years old and approximately 175 cm. tall, averaged an increase of 16 mm. in height. There was no variation in the height of the perineum in either subject.

Figure 4 represents the variations in height of the two subjects during fifteen hours while they engaged in similar activities. The general shape of the two curves is similar. Both gained height rather rapidly when first lying down and more gradually thereafter throughout the night. On arising in the morning, height is lost rapidly during the first hours and thereafter more gradually during the day. When a rest is secured by lying down later in the day, height is again gained rapidly.

Furthermore, roentgenograms of the thoracic and lumbar vertebrae of subject B, made at bedtime and immediately on arising after seven hours of sleep under otherwise identical conditions, showed that the increase in height was due to increase in height of the intervertebral disks. Comparison of the height of the intervertebral disks measured with calipers showed significant differences throughout the spinal column. For example, the third lumbar disk was almost 2 mm. higher in the morning.

REPORT OF CASES

In order to demonstrate the value of recognizing the root character of pain, I report 2 cases:

CASE 1.—A man aged 36 was referred to the Section on Gastro-Enterology at the clinic because of a severe aching pain localized in a region about 6 cm. in diameter deep in the left upper part of the abdomen, under the costal margin. At the onset, two years previously, the pain had occurred about once a month and while the patient had been asleep. It had then become more frequent. In the months prior to his admission to the clinic it had occurred almost every night between 1 and 4 a. m. When the patient had got out of bed, stretched and walked about, the pain had been relieved in about fifteen minutes. If he then had returned to bed, it usually had recurred in from thirty to sixty minutes. He had found that sleeping in a chair prevented the pain. The pain had also occurred at times during the day, but never while he had been in the upright position and moving about. Coughing and sneezing had intensified the pain when it had been present but never had produced the pain.

The results of general neurologic examination were negative except for the finding that flexing the neck far forward, so that the chin rested on the thorax, reproduced the pain to a slight but definite degree. There was a narrow zone of hyperesthesia corresponding to the left seventh thoracic spinal segment. This zone was over the site of the spontaneous pain. There was tenderness on percussion over the fifth thoracic vertebra. Localized stereoscopic roentgenograms of the mid-thoracic portion of the spinal column did not disclose any abnormality. Lumbar puncture was performed but the results were negative except for a positive Nonne test for globulin and elevation of the concentration of total protein to 70 mg. per hundred cubic centimeters (the normal value is less than 45 mg. per hundred cubic centimeters). The Queckenstedt test was negative. Roentgenoscopic study of the spinal subarachnoid space after the injection of 5 cc. of iodized oil into the lumbar region revealed a defect interpreted as representing an intradural extramedullary tumor, 1 cm. in diameter, opposite the lower border of the body of the fifth thoracic vertebra. Subsequently a small neurofibroma of the seventh thoracic root on the left side was removed and the result was gratifying.

CASE 2.—A man aged 48 had fallen a distance of 8 feet two years and four months before he came to the clinic. He had landed in a sitting position in such a way that a protruding iron rod had pierced the left side of his scrotum and left thigh. Two periods of hospitalization had been necessary to effect closure of the resulting sinuses. His claim for compensation had then been settled in lump sum. The patient had been unable to return to work, however, because of a severe pain in the lower part of his back which had extended down the posterior aspect of the left thigh and leg into the foot. He then had attempted to reopen his case before the industrial commission, believing that his disability was the result of his injury. The claim had not been allowed, since there was no roentgenographic evidence of lumbosacral injury. The patient then came to the clinic voluntarily to seek relief.

Roentgenograms of the spinal column showed some hypertrophic changes and narrowing of the lumbosacral space. The patient volunteered the information that coughing, sneezing, straining at stool and heavy lifting intensified the pain. Examination revealed that bending forward, straight leg raising, extension of the leg while the knee was flexed on the abdomen and bending the head far forward on the thorax intensified the pain.

Because of the definite root character of the pain, further investigation was carried out. Spinal puncture at the fourth lumbar interspace gave negative results except for showing a positive globulin test and elevation of the total protein to 100 mg. per hundred cubic centimeters. The suspicion of the presence of a protruded intervertebral disk at the lumbosacral junction was verified roentgenoscopically after 5 cc. of iodized oil had been injected into the spinal subarachnoid space. Subsequent removal of the protruded disk and hypertrophied ligamentum flavum dorsal to it was successful in relieving the pain.

SUMMARY

Pain resulting from disease of the sensory nerve roots secondary to extramedullary tumors of the spinal cord, protruded intervertebral disks and other spinal lesions is not uncommon. The pain occurs in the distribution of the nerve root involved and frequently is localized in a small part of the total region supplied by that nerve root.

Characteristically this pain is produced or intensified by (1) a sudden increase in intra-abdominal and intra-thoracic pressure, such as occurs in coughing, sneezing, straining at stool or lifting, and (2) by stretching of the involved nerve roots, as in bending the head forward on the thorax, stooping forward with the knees straight, straight leg raising, the Lasègue maneuver, and by spontaneous elongation of the spinal column during sleep.

Clinical Notes, Suggestions and New Instruments

INTRACEREBRAL CLOT COMPLICATING ECLAMPSIA WITHOUT CONVULSIONS

SURGICAL REMOVAL OF CLOT WITH RECOVERY

WALTER D. ABBOTT, M.D., DES MOINES, IOWA

Eclampsia is a clinical entity which is not satisfactorily defined from either an etiologic or a pathologic point of view. Williams¹ states that eclampsia is an acute toxemia usually but not always accompanied by convulsions. However, De Lee² remarks that this condition is not a disease but merely a symptom of some underlying cause, and he further mentions that cerebral hemorrhages of varying size frequently occur in eclampsia with this finding present in 40 per cent of autopsy material. Slemmons³ in 1907 reviewed the literature to that date and Liebmann⁴ in 1925 quoted Schmorl's definition of eclampsia as "degenerative kidney changes, particularly in the convoluted tubules where albumin and fatty alterations are observed: necrosis in the liver with thrombosis in the interlobular and intralobular vessels; degeneration in the heart, particularly in the muscles; hemorrhage and softening into the brain; and a widespread thrombosis in the internal organs."

Bell⁵ more recently described a characteristic glomerular lesion of the kidney consisting of dilatation of the glomerulus and thickening of the capillary basement membrane with narrowing of the lumen of the capillaries. Of the 46 cases that have been reported, Slemmons found the reports of 7 and added 2 more in 1907. The next review was that of Schmidt⁶ in 1911 and brought the total to 24. Caffier⁷ found 38 cases up to 1927 with 4 others that had to be discarded because of the incompleteness either of the history or of the autopsy. His paper brings the literature to that date. Since then, similar conditions have been reported by Liebmann, Pohl,⁸ Bock⁹ and Wronski.¹⁰ Bock adds also the case of Berg and mentions 3 others as well as the case of Thalheimer, which cannot be

included because of the lack of necropsy evidence. Knight¹¹ in 1925 added a case in which there was hemorrhage into the frontal lobe, and King¹² in 1933 reviewed the literature, bringing the total to 46 cases. However, only 30 are carefully analyzed in his report because of inadequate records. The age limit was from 18 to 43 years and the parity from primigravida to tertiodeciparity, with a distribution of 19 primiparas and 11 multiparas. Antepartum cases numbered 14, the earliest of which was at three months, and 10 occurred during delivery and 6 during the puerperium.

These proportions are similar to those reported by Greenhill for the distribution of true eclampsia. Of these cases only 14 showed true premonitory signs. This amazingly low figure makes the seriousness of the situation all the more apparent. It is not impossible that symptoms would have been observed in the others had they been looked for, but this fact emphasizes again the necessity for the strictest watchfulness by those attending patients in confinement.

Headache was the most common symptom, followed by vomiting and edema. Visual disturbances occurred in only 7 instances and epigastric pain in 6 instances. Albumin in the urine was reported 15 times, and an elevation of temperature was observed in 15 cases. In 9 instances circulatory collapse was the first warning of anything abnormal, and in 8 cases unconsciousness with or without the cardiac signs ushered in the condition. The blood pressure records have not been carefully taken in all instances, particularly in the reports from Europe. The description of cerebral involvement has been inadequate, and Schmorl¹³ describes bleeding into the brain as the significant part of the pathologic condition which has been confirmed by these various reports. However, the type of hemorrhage will vary from a petechial to a massive hemorrhage into the frontal or occipital lobe or into the internal capsule, and in 1 case into the pons. One not infrequently sees this hemorrhage occur in the absence of convulsions, and Benda¹⁴ feels that the increased capillary permeability is due to the toxemia.

The 2 cases reported by Cronin and Knight¹⁵ are the only ones apparently in which recovery from massive hemorrhage occurred, and in neither instance did the patient have convulsions. King states that in 9 cases exclusive of his report massive hemorrhage into one or the other part of the brain is reported. These are the reports of various authors cited in his extensive review of the literature. The fact that such a condition occurs sounds a warning note to prevent or at least attempt to combat such a condition when it does occur.

The following report is the only one in which surgical removal of the clot has been rewarded by recovery of the patient. This report comprises the record of a patient in the so-called intern training service—a low cost patient paying only a minimal hospital expense and being cared for by the intern in a teaching program. The patient was examined by the intern at frequent intervals during the antepartum stage under the direction of an attending obstetrician, and it is of note that the intern was alert in calling for adequate consultation, which proved the diagnosis in this case and led to prompt and efficient treatment.

REPORT OF CASE

Mrs. R. H., aged 19, had been seen at the antepartum clinic since October 1940 by Dr. Eugene Penn. This was her first pregnancy and each time she visited the clinic her condition was satisfactory until March 10, 1941, at which time it was noted that she had gained 9½ pounds (4,300 Gm.) in the previous week, that her blood pressure had risen from 120 systolic and 80 diastolic to 130 systolic and 100 diastolic and that the urine contained a considerable amount of albumin. The patient stated that for four days she had suffered from a severe head-

From the Department of Neurosurgery, Iowa Methodist Hospital, 1931.

1. Williams, J. W.: *Obstetrics*, ed. 6, New York, D. Appleton & Co., 1931.

2. De Lee, J. B.: *Principles and Practice of Obstetrics*, Philadelphia, W. B. Saunders Company, 1938.

3. Slemmons, J. M.: Eclampsia Without Convulsions, *Bull. Johns Hopkins Hosp.*, **18**: 338, 1907.

4. Liebmann, S.: Eklampsie ohne Krämpfe, *Zentralbl. f. Gynäk.*, **49**: 1906 (Aug. 22) 1925.

5. Bell, E. T., and Clawson, B. J.: Experimental Glomerulonephritis in a Monkey, *Am. J. Path.*, **7**: 57 (Jan.) 1931.

6. Schmidt, H. H.: Eklampsie ohne Krämpfe und ohne Bewusstlosigkeit, *Ztschr. f. Geburtsh. u. Gynäk.*, **69**: 143, 1911.

7. Caffier, P.: Retrospektive Diagnose auf Eklampsie ohne Krämpfe, *Med. Klin.*, **23**: 162 (Feb. 4) 1927.

8. Pohl, R.: Pletztlicher Tod in der Schwangerschaft, *Zentralbl. f. Gynäk.*, **51**: 1913 (April 9) 1927.

9. Bock, A.: Klinischer Beiträge zur tödlichen Gestose ohne Krämpfe, *Zentralbl. f. Gynäk.*, **52**: 102 (Jan. 14) 1928.

10. Wronski, M.: Zur Eklampsie ohne Krämpfe, *Zentralbl. f. Gynäk.*, **52**: 1528 (June 15) 1929.

11. Knight, L. C.: Eclampsia with Cerebral Hemorrhage in the Puerperium, *Illinois M. J.*, **47**: 53-54 (Jan.) 1925.

12. King, A. G.: Eclampsia Without Convulsions Terminating in Cerebral Apoplexy, *J. A. M. A.*, **100**: 15-16 (Jan. 7) 1933.

13. Schmorl: *Arch. f. Gynäk.*, **65**: 504, 1902.

14. Benda, R.: *Zentralbl. f. Gynäk.*, **50**: 727 (March 20) 1926.

15. Barrett, C. W., and Haeger, S. B.: A Consideration of Eclampsia with a Case Accompanied by Hemiplegia, *Am. J. Obst. & Gynec.*, **64**: 463 (Sept.) 1905.

ache accompanied by spots before her eyes and that there was some swelling of her feet and legs. On March 13 she entered the hospital complaining of headache in the occipital region and was in labor that lasted for ten hours. She was seen in consultation by Dr. A. W. Brown; light ether anesthesia was administered and delivery of a normal boy weighing 8 pounds (3,630 Gm.) was effected by low forceps delivery. She was given 2 cc. of 50 per cent magnesium sulfate intramuscularly and 500 cc. of 20 per cent dextrose intravenously. After the anesthesia the patient remained stuporous, pale, cold and clammy. The pulse rate ranged from 120 to 140 a minute and the respiratory rate from 28 to 30 a minute; the blood pressure remained at 140 systolic and 102 diastolic.

At no time did she show any evidence of a convulsion. However, her pupils were dilated and did not react to light, and there was a homonymous hemianopia to the left with a slow horizontal nystagmus. Ophthalmologic examination by Dr. J. A. Downing revealed a 5 diopter choked disk on the right, 3 diopters on the left with the left homonymous hemianopia.

Roentgenograms of the skull were negative and neurologic examination was negative except for the profound stupor. The temperature remained at 101 F., and the blood pressure at 140 systolic and 102 diastolic. The pulse rate was 60 a minute and the respiratory rate was 14 a minute. Examination of the urine revealed an acid reaction, the specific gravity was 1.024, albumin was 6.5 Gm., there were occasional pus cells and the blood urea nitrogen was 28 mg. per hundred cubic centimeters. Examination of the blood otherwise was negative, as was the Wassermann reaction.

Hypertonic dextrose was administered daily by venoclysis. A diagnosis of a lesion of the right occipital lobe was made and I felt that it was questionable whether this was the result of an intracerebral hemorrhage or a preexisting glioma with hemorrhage into the tumor, and two days later under anesthesia of avertin with amylene hydrate ventricular studies were attempted. Perforator openings were made over the occipital regions of the skull and when a trocar was passed into the right occipital lobe resistance was met at a depth of 3 cm. Aspirations from the trocar resulted in the removal of clots of old blood. A trocar was then passed into the left lateral ventricle and clear fluid escaped under pressure. A total of 60 cc. of fluid was replaced with an equal amount of air, and roentgenograms revealed a shifting of the ventricular system to the left and a failure of filling of the posterior horn of the right lateral ventricle. An osteoplastic flap was then turned over the right occipital area and the brain was found to be under a significant increase of pressure with a flattening of the convolutions of the occipital lobe. The cortex was incised and a blood clot weighing 8 Gm. was removed.

After removal of this clot there was bleeding from the small branch of the posterior cerebral artery, which was controlled with electric coagulation. A sample of tissue taken from the surrounding area was examined by Dr. R. F. Birge, who stated that there was no evidence of tumor. The patient made a satisfactory recovery and on June 6 stated that she felt no symptoms except an inability to see to the left. Her vision was 20/20 in the right eye and 20/25 in the left eye, and the choked disks had completely receded. However, there is a residual homonymous hemianopia on the left side. The blood pressure was 120 systolic and 80 diastolic and urinalysis was negative with blood urea nitrogen 14 mg.

SUMMARY

A young woman's life was spared by alert care and adequate consultation. It would have been logical to assume that her drowsy state was the result of toxemia. However, with the presence of papilledema and hemianopia, the presence of an organic lesion was obvious.

The presence of syphilis and of arteriosclerosis were eliminated; therefore, the most plausible explanation for the hemorrhage was increased capillary permeability exacerbated by a toxic state and the sudden rise in blood pressure.

This case is reported in the hope that all patients in an eclamptic state, with or without convulsions, will receive the benefit of adequate ophthalmologic and neurologic consultation so that, if similar circumstances occur, lives may be saved by prompt treatment.

1422 Des Moines Building.

A TRUSS FOR INGUINAL HERNIA IN INFANTS

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Surgical repair of inguinal hernia in children under 2 years of age is rarely indicated except in emergencies. The mother is averse to surgery and the surgeon hesitates to operate because some hernias, especially in very young infants, disappear spontaneously. As long as the child has not been trained the danger of a postoperative infection, while not great with proper precautions, nevertheless exists and adds to the hazard of surgical repair. To prevent incarceration and to aid nature in the spontaneous closure of the peritoneal pouch, a proper truss must be adjusted. The requirements of a truss for infants are specific. It must remain in place and must retain the hernia even when the child is coughing or crying. It must be comfortable, nonirritating, sanitary and simple to apply correctly. The cost should be minimal in a large charity outpatient department where a large number is required.

A truss meeting these requirements has been used in the outpatient department of the Children's Memorial Hospital of Chicago for the past two years on approximately 50 infants.

The pad is of ordinary white outing flannel. Two triangular pieces of cloth measuring 3 inches from corner to corner are

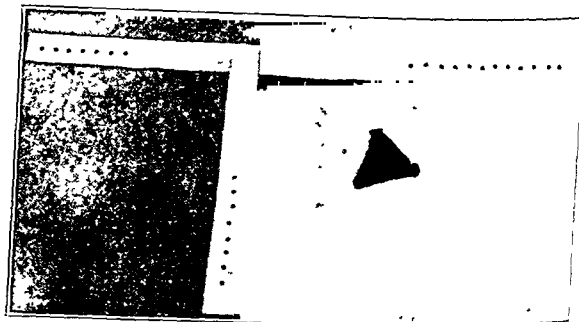


Fig. 1.—Truss and binder ready for use.

sewed together except for a small space on one side. The pocket thus made is turned inside out to bring the seams inside and is stuffed tightly with cotton. The seam is completed and a small button is sewed to each corner (fig. 1). The finished pad measures approximately 2 inches from corner to corner.

The binder is made of two strips of pure gum rubber $\frac{7}{8}$ inch wide and about $\frac{1}{20}$ inch thick; one is 18 inches long and the other 9 inches long. The 9 inch strip of rubber is cemented to the 18 inch strip 6 inches from either end. The long strip goes around the abdomen, the short one across the perineum. From six to eight holes $\frac{1}{16}$ inch in diameter and $\frac{1}{2}$ inch apart are punched in each end of the long strip, and from four to six similar holes are punched in the perineal strip. The binder can be used on either side merely by reversing it. The truss is now ready for application (fig. 2).

The rubber strips will be too long for small infants and can be cut to fit, allowance always being made for the growth of the child. The truss should be applied snugly enough to keep the hernia reduced but not so snugly that it pinches the skin. Unless the child has an unusually large hernial ring, very little pressure is necessary to accomplish this. After the truss has been applied the child is made to cry to test the effectiveness of the pressure on the pad.

The mother is instructed to make a number of pads, using the one given her as a model. A fresh pad can be applied as often as is necessary for cleanliness. The soiled pads are

washed with soap and water and are dried for future use. Each morning when the baby is bathed (if it is bathed) the binder may be removed, washed and powdered. However, if the baby cries during its bath it is well to leave the truss on and put on a dry pad after the bath is concluded. It is important that the hernia be kept reduced always, or closure

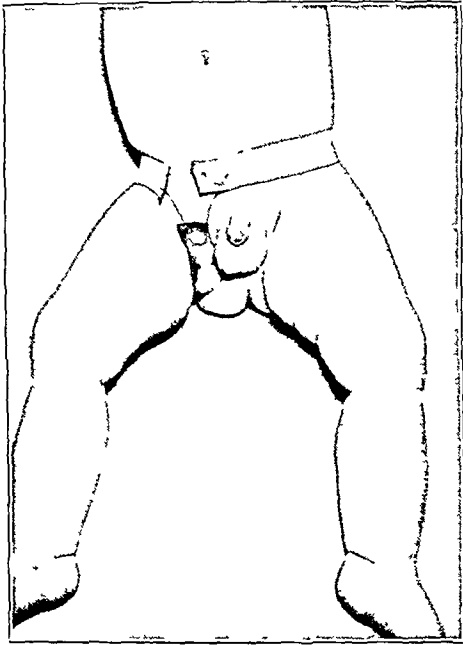


Fig 2—Truss in place

will not be accomplished. Plenty of powder on the skin beneath the rubber will prevent irritation of the skin. Thus far I have seen only 1 child whose skin was sensitive to rubber.

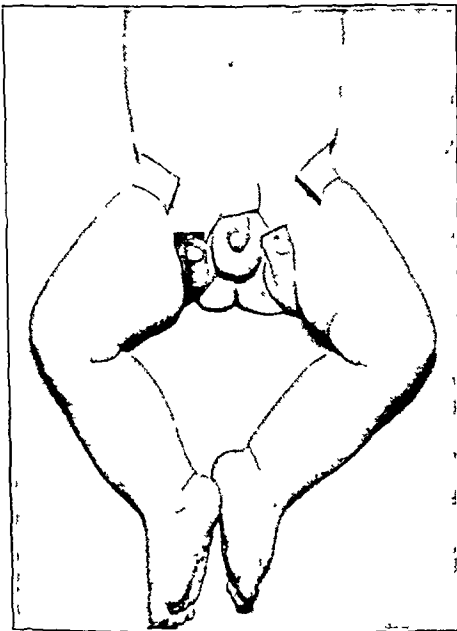


Fig 3—Modification of truss for an infant with a bilateral inguinal hernia

For the occasional child with a bilateral inguinal hernia a binder with a double perineal strap and two pads adjusted as illustrated in figure 3 can be applied.

The cost of these trusses is approximately 4 cents apiece. The rubber lasts from four to six months.

715 Lake Street.

Council on Physical Therapy

CHAPTER VIII. THE MANUFACTURE OF ARTIFICIAL LIMBS

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING CHAPTER, WHICH IS THE TENTH AND LAST OF A SERIES ON AMPUTATIONS AND ARTIFICIAL LIMBS TO APPEAR IN THIS COLUMN. WHEN COMPLETED, THE SERIES WILL BE PUBLISHED IN THE FORM OF A HANDBOOK ON AMPUTATIONS. THE COUNCIL WISHES TO EXPRESS ITS APPRECIATION FOR THE COOPERATION OF ITS GROUP OF CONSULTANTS ON ARTIFICIAL LIMBS. THE COUNCIL IS REPRESENTED BY DRS. FRANK D. DICKSON, HARRY E. MOCK, FRANK R. OBER, S. PERRY ROGERS, PAUL STEELE AND PHILIP WILSON, AND THE ASSOCIATION OF LIMB MANUFACTURERS OF AMERICA IS REPRESENTED BY MESSRS. MCCARTHY HANGER SR., W. E. ISLE, JOSEPH A. SPIELAK, DAVID E. STOLPE AND J. B. KORRADI.

HOWARD A. CARTER, Secretary.

1 THE INDUSTRY

The manufacturer of artificial limbs combines a profession with a trade and a business. The measurement, fitting and adjustment of a prosthesis, the choice of material, the distribution of weight, the alinement and balance necessary for optimal function and appearance certainly constitute a profession; in the best hands they are an art. The actual construction of a finished appliance from its basic raw materials constitutes a skilled trade; in the aggregate, an industry. Yet the manufacturer's income depends on the successful operation of a retail business, with salesmen on the street,

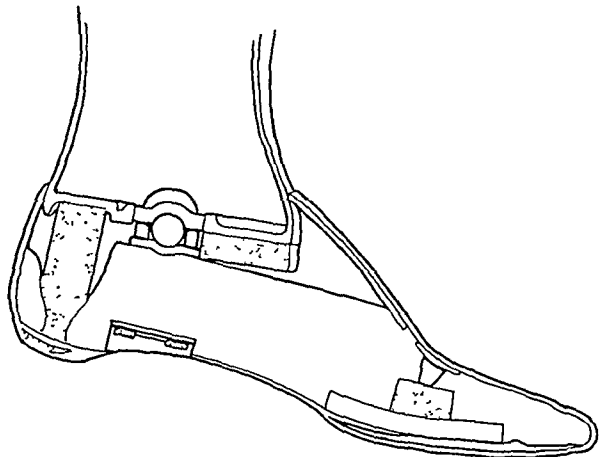


Fig 1.—Wooden foot, toe joint of rubber belting, U bolt ankle with bronze bushing, rubber bumpers

a store for the reception of customers and a set of books which balance in the black. No standardization of the finished product is possible; most sales are individual sales, and every product is individually tailored to a particular patient.

Historically, the limb manufacturer combined all of these phases of his work in his own person. In addition to being his own salesman and fitter, he cured his own wood, hammered out his own joints at his forge and worked his own leather and wood and metal into a finished limb. Frequently he was his own first customer. The founders of a number of our largest manufacturing firms were men who had lost limbs in the early days of American railroading or in the war between the states. The industry is still distinguished by the fact that considerably more than half of all the persons engaged in all its branches are themselves wearers of artificial limbs.

As the industry grew up it underwent a degree of specialization and consolidation. Aluminum alloys,

special steels, fiber, leather and rawhide, webbing, rubber, ball and roller bearings and other basic materials are purchased from other industries. The growth and seasoning of willow wood has been centralized, as has the knitting of stump socks of wool and cotton. The manufacture of standard types of steel joints and the preliminary shaping of aluminum alloy tubes have been segregated into a few units. The patenting of mechanical features has led to centralization of the manufacture of such parts by the patent holder or his licensees. Thus there are parts manufacturers, accessory manufacturers and supply houses selling a greater or lesser proportion of the finished product to the ultimate manu-

to facilitate improvements and refinements in artificial limbs and to establish standards for ethical conduct and sound business practice. The Association of Limb Manufacturers of America has increased in membership and strength until today it represents the major part

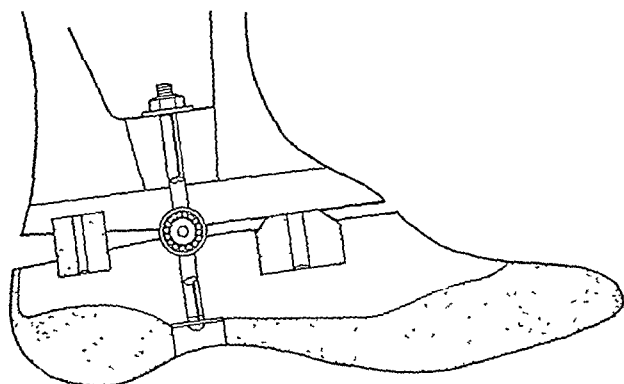


Fig 2—Sponge rubber foot with wood core, eye bolt type ankle with quadruple ball bearings, limited ankle motion controlled by rubber bumpers.

facturer of the individual limb. The larger manufacturing concerns, who have many retail branches, may manufacture more of their basic parts and accessories, but every branch must still perform the three basic functions of the individual limb maker: make the sale, measure the stump, fit the limb, alter it if necessary, service it as required, and show a profit as a business. While limb manufacture in England and in continental Europe has tended toward standardization, it has here remained highly individualistic and highly competitive; the personal skill and individual manufacturer and fitter are

The Association of Limb Manufacturers of America was organized in 1917. Prior to this the manufacturers of artificial limbs were not organized as an industry except as business men affiliated with boards of trade

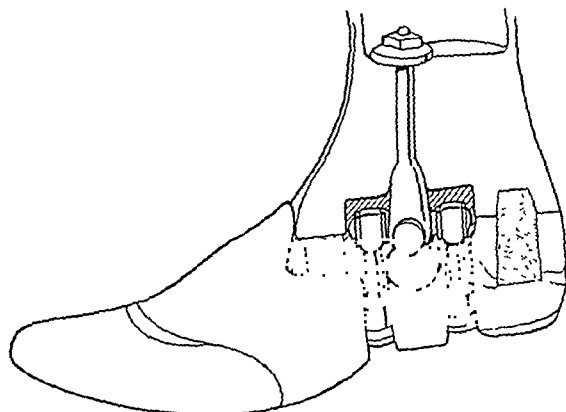


Fig 4—Mechanical ankle joint permitting lateral motion.

of the industry and embraces the entire United States and part of Canada. The business of the association is administered by a board of directors, and local groups are organized into regional councils in various centers throughout the United States. A monthly magazine called the *ALMANAC* disseminates information of interest to the members as well as technical articles relating to the construction and fitting of artificial limbs, new products and devices.

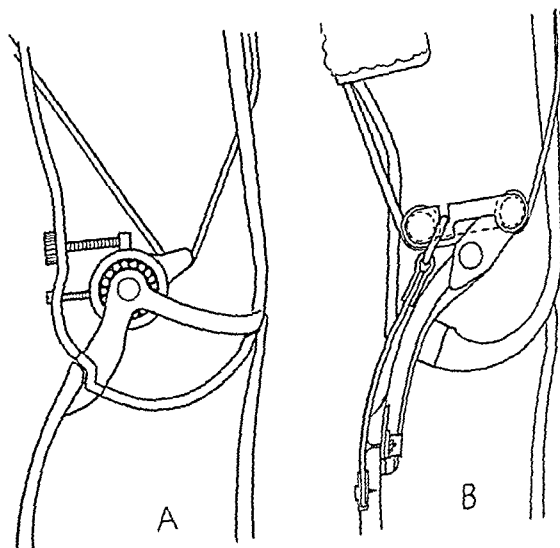


Fig 5—Inside knee control A, single roller type, B, double roller type

2 MATERIALS

The major portions of a modern artificial limb are constructed of one of three materials: wood, fiber or aluminum alloy.

Willow and bass (linn) are the woods usually chosen for their qualities of lightness, flexibility and strength. For the construction of legs, thighs and sockets, blocks of suitable size, free from sap, rot or large knots, are chosen, hollowed through the center and carefully seasoned for several years. Sockets are shaped on the inside to fit the stump accurately, with due allowance for scars and other tender points. Shin piece- and

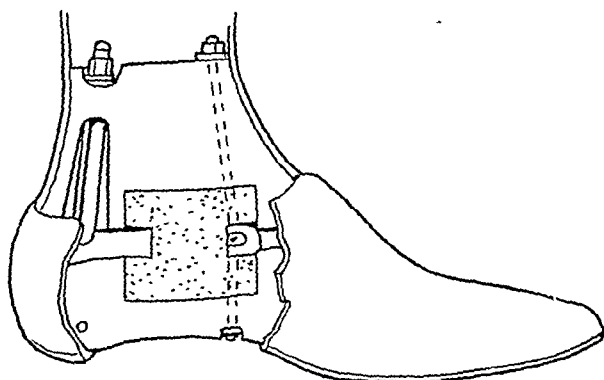


Fig 3—All rubber ankle joint permitting lateral motion

and other associations composed of a variety of different industries. At the behest of the United States government the artificial limb industry undertook the formation of an organization to promote better understanding among the members and, by the interchange of ideas,

thigh pieces are shaped on the outside to conform to the size and shape of the normal extremity and then cut out on the inside so as to leave a shell of the thickness demanded for strength, usually between $\frac{1}{4}$ and $\frac{3}{8}$ inch. Brass screw wire may be threaded through and across the grain to add strength, and the whole is covered with one or two layers of rawhide, shrunk on tightly and cemented to the wood. Joints are riveted into place, and the necessary controlling harness is attached. The inner and outer surfaces are lacquered or enameled to make them resistant to moisture and perspiration.

Wood as a material for artificial limbs has a number of undeniable virtues. It is light, clean, cool, strong and odorless. Its thickness, and therefore both its weight and its strength, are readily adaptable to the functional needs of the individual patient. It is less flexible than fiber, but more flexible than metal. It is relatively impervious to weather and to corrosion by perspiration or chemicals. It withstands sudden and repeated shocks well, and it does not dent. It can be repaired with relatively simple tools. It is probably still the choice for the heavy man doing manual labor and likely to take the minimum of care of his appliance.

Fiber is essentially paper chemically treated and vulcanized into sheets. That used for artificial limbs is made especially for the purpose and is approximately $\frac{3}{4}$ inch thick. It is cut and pressed into appropriate

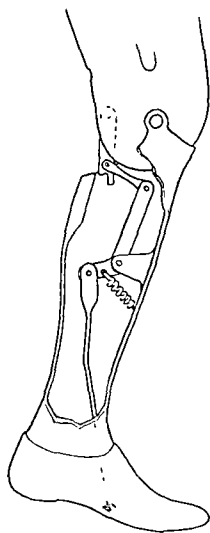


Fig. 6—Automatic knee lock.

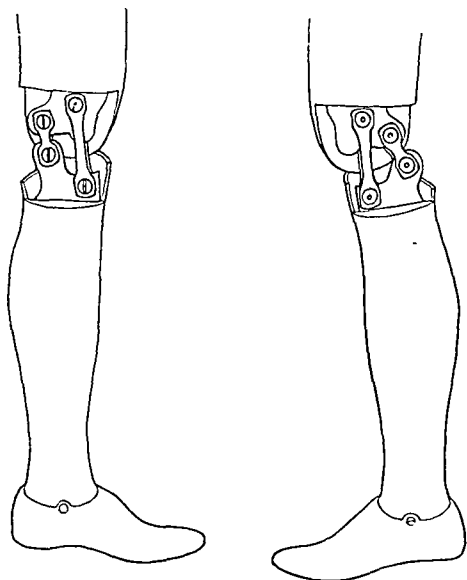


Fig. 7.—Polycentric knee mechanism.

shapes and riveted together. It is light, extremely flexible, and will not dent. Its riveted construction permits sockets to be taken in or let out and allows some repairs to be made with a minimum of skill or equipment. A finished limb is no lighter than one of wood or metal. Its durability and its resistance to shock, dampness and corrosion are not so good.

The manufacture of all-metal limbs, begun about 1918 with the use of duraluminum or "airplane metal," has increased steadily. The metal used consists of one of the "heat-treated" alloys, of which there are now several, each possessing slightly different physical properties. Formerly shaped from sheets of 16-18 gage and riveted or welded, the parts are now generally worked from spun tubes, by eccentric spinning, by hydraulic pressure within an outside mold or by outside pressure over an inside mold. The alloys available and the methods of working them have both improved steadily. Sockets of wood, leather, plastic or aluminum are inserted. The metal socket may be adjusted by cutting and rewelding. Steel joints, incorporating bronze bushings and roller or ball bearings are riveted or pressed into place. Standard feet and the usual harness are added, and a flesh-colored enamel may be applied.

Metal limbs may be made lighter than the average wooden limb. In general, the higher the amputation the greater the weight advantage in metal. Breakage is less common with modern construction. A sharp blow, however, will produce a dent in the metal surface, often difficult to remove. The tendency to noise has been minimized by the substitution of pressed sleeves and welds for rivets. Their repair requires special skill and equipment. In general they are preferred for persons who do not regularly engage in hard physical work and who are likely to take reasonable care of their prostheses.

3. CONSTRUCTION

A. Feet.—In the construction of a wooden foot a block of wood is worked down to conform to the size and shape of the normal foot, usually with the aid of a shoe supplied by the patient. The block is recessed to accommodate an ankle joint mechanism. Provision is made for flexibility at the ball of the foot either by the use of a joint at this point or by construction of the entire forefoot from rubber or felt. A pad of gum rubber is placed beneath the heel. The wood portion may be covered with rawhide and the sole, or even the entire foot, with soft leather (fig. 1).

Other feet are constructed principally of either rubber or felt, with a core of wood only sufficient to retain the ankle joint mechanism. With flexibility of the entire foot provided by the choice of basic material, a joint at the forefoot is eliminated and the range of motion required at the ankle joint proper is less (fig. 2).

B. Ankle Joints.—Feet made of rubber or felt and solidly attached to the leg have been used, but most manufacturers now provide limited ankle motion through some kind of joint. The usual joint construction consists of a transverse steel cylinder attached to the leg, resting in a semicylindric leather bushing in

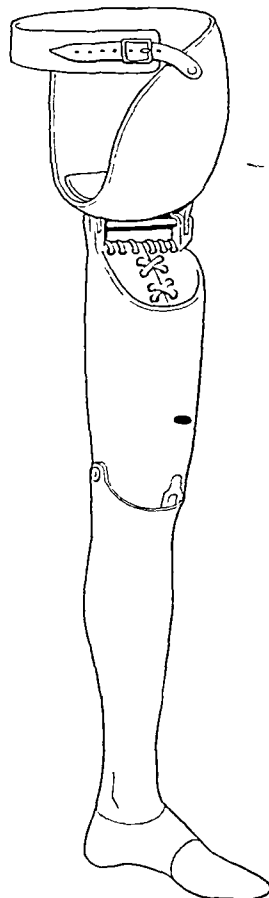


Fig. 8.—Tilting-table leg.

the foot and held to the foot by either a U-bolt or an eye-bolt. The U-bolt is generally provided with a semicircular bronze bushing, whereas variations of the eye-bolt principle commonly utilize ball or roller bearings. Compound joints designed to spare the stump by allowing lateral motion of the foot on uneven sur-

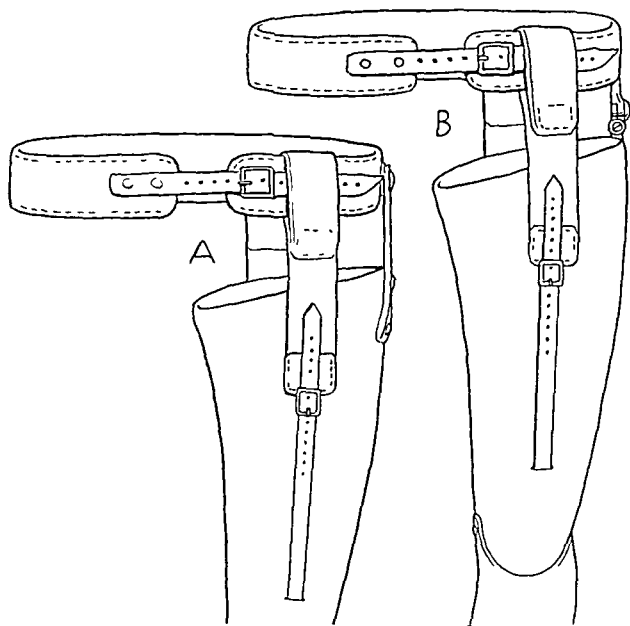


Fig. 9.—Pelvic belt: A, with single joint permitting motion in one plane, B, with compound joint permitting motion in two planes

faces have been experimented with for many years but have never been generally accepted. Two attempts to accomplish this end have, however, been just recently introduced, one consisting essentially of a square block of rubber mounted firmly to both foot and leg and controlled by toe and heel cords (fig. 3), the other a compound mechanical joint mounted in rubber bumpers (fig. 4).

C. Knee Joints.—Side joints for below knee amputations are essentially long, flat steel bars, integrated through either bronze bushings or ball bearings and provided with a simple stop to prevent hyperextension. Knee bearing, through knee and transcondylar amputations require side joints of considerably greater strength.

A stump 4 or more inches shorter than the sound

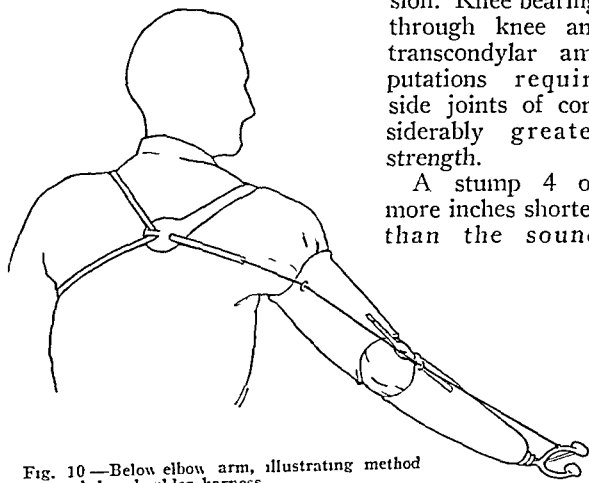


Fig. 10.—Below elbow arm, illustrating method of control by shoulder harness.

thigh (2½ to 3 inches above the center of knee motion) allows room for any one of a variety of knee mechanisms built around a transverse steel spindle set in bearings at either side of the thigh piece. The same suspenders used to carry the weight of the prosthesis,

falling in front or in back of the thigh, may be passed over eccentric rollers mounted on the central spindle in such a way as to actuate and control the swing of the shin piece in a manner simulating the natural gait (fig. 5).

Stability of an artificial knee joint, i. e. assurance against its "jack-knifing" from under the patient, may be provided in a number of ways. A positive lock, controlled by a rod passing down the outer side of the thigh, provides absolute stability in walking and may be unlocked for sitting, but it naturally requires an awkward, stiff-legged gait. A recently invented knee-lock, actuated by a rod from the forefoot, automatically locks when the weight is placed on the heel and unlocks when the weight is placed on the ball of the foot (fig. 6). Setting a freely movable joint so as to allow some hyperextension assures stability but produces a slow, awkward gait. Increasing the "fixed equinus" of the ankle, by raising the front bumper in the foot, stabilizes the knee through most of the gait, but this maneuver increases the length of the arc which must be swung through each step, and it transmits a shock through the socket which cannot be tolerated by short or sensitive stumps. The standard practice of setting the transverse axis of knee motion

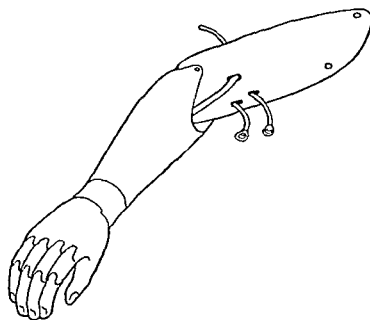


Fig. 11.—Above elbow arm, with mechanical hand and automatic control of rotation of the wrist.

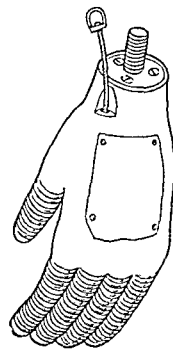


Fig. 12.—Mechanical hand with digits that are formed of spiral spring steel

well behind the center of the thigh adds stability while increasing the length of the knee-toe arc to a less extent. Several ingenious polycentric mechanisms prohibit flexion of the knee while weight is borne on the limb, allow a greater range of flexion, and materially shorten the knee-toe arc when the knee is flexed (fig. 7).

D. Hip Joints.—Disarticulation and very short thigh stumps may have to be fitted with what is called a "tilting table" limb (fig. 8). The buttock sits in a bucket securely strapped to the pelvis, motions of which are used to swing the limb. A pair of joints, mounted just under the bucket, are locked for standing and walking and unlocked for sitting. Pelvic belts have been added to thigh limbs for years to increase their stability, especially with short stumps. Recent manufacturing practice has shown an increased use of pelvic belts with hip joints to replace shoulder harness entirely (fig. 9A). Some of these devices permit motion in the same plane at two points. Others permit motion in two planes (fig. 9B).

E. Arms.—Artificial arms are attached and controlled by means of harness passing about the chest and about the opposite shoulder (fig. 10). Elbow joints allow only axial motion. Rotation of the hand is accomplished by a rotary joint at the wrist, usually turned and locked by the other hand but sometimes integrated with motion of the elbow (fig. 11). With long forearm

stumps, flat enough to impart rotary motion to a socket, leather straps are substituted for metal joints between the forearm and arm corsets.

F. Hands.—Artificial hands made of molded rubber, felt or wood may be worn principally for appearance.

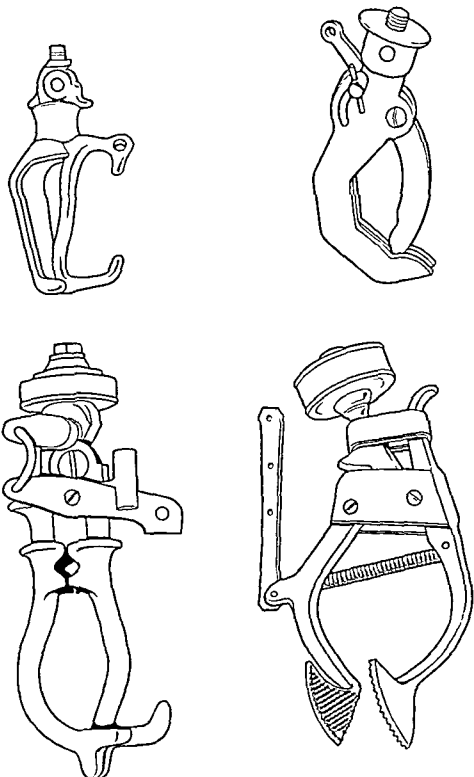


Fig. 13—Various types of work hooks

Mechanical hands are made of metal, wood or rubber reinforced with metal. Either the thumb or the fingers or both may be jointed. Fingers may be jointed at one, two or three points. In one type of mechanical hand the fingers and thumb are constructed of spiral spring steel wire which forms the flexible shape of fingers, inside of which are simple jointed steel rods, this construction being less costly and quite as effective as forming the fingers and joints of wood or other material (fig. 12). Control cords arise from a loop about the opposite shoulder, so that the natural motion of extension of the stump within its socket serves to pull on the cord. Hands may be closed by mechanical spring action and opened by the control cord, or vice versa. A locking device may be incorporated in either type. A glove is usually worn on the mechanical hand. A variety of mechanical appliances are available as substitutes for any mechanical hand. Mechanical hooks, rings and vises are more or less standardized, although any special tool may be so applied (fig. 13). A uniform method of attachment at the wrist may allow quick attachment of an artificial hand, a mechanical hand or any type of mechanical appliance to the same arm (fig. 14).

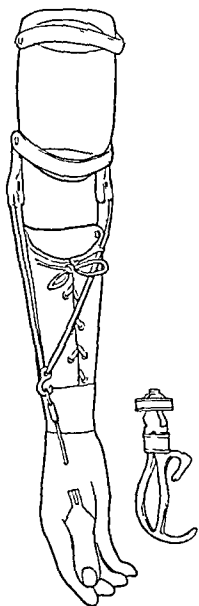


Fig. 14.—Inter-changeable hand and hook

may allow quick attachment of an artificial hand, a mechanical hand or any type of mechanical appliance to the same arm (fig. 14).

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

THEODORE G. KLUMPF, M.D., Secretary.

DEXTROSE (See New and Nonofficial Remedies, 1941, p. 179).

Endo Products, Inc., Richmond Hill, N. Y.

Ampoules Dextrose 50%, 20 cc.: Each ampoule contains 20 cc. of a solution containing 10 Gm of dextrose-U. S. P.

Ampoules Dextrose 50%, 50 cc.: Each ampoule contains 50 cc. of a solution containing 25 Gm of dextrose-U. S. P.

Ampoules Dextrose 50%, 100 cc.: Each ampoule contains 100 cc. of a solution containing 50 Gm of dextrose-U. S. P.

DIPHTHERIA TOXOID (See New and Nonofficial Remedies, 1941, p. 462).

The National Drug Company, Philadelphia.

Diphtheria Toxoid (Plain)—(See New and Nonofficial Remedies, 1941, p. 463): For the three dose method of treatment, the following forms are marketed. packages of one immunization treatment, consisting of one 3 cc ampul-vial containing three doses; packages of five immunization treatments, consisting of one 15 cc. ampul-vial containing fifteen doses. Contains merthiolate 1:10,000 as a preservative.

SOLUTION LIVER EXTRACT PURIFIED-LILLY (See New and Nonofficial Remedies, 1941, p. 340).

The following dosage forms have been accepted:

Ampoules Solution Liver Extract Purified Lilly, 10 U. S. P. Injectable Units Per cc., 10 cc. Marketed in 10 cc. rubber stoppered ampoules

Ampoules Solution Liver Extract Purified Lilly, 5 U. S. P. Injectable Units Per cc., 10 cc. Marketed in 10 cc. rubber stoppered ampoules.

SULFATHIAZOLE (See New and Nonofficial Remedies, 1941, p. 514).

The following dosage form has been accepted:

Tablets Sulfathiazole-Merrell, 0.5 Gm. (7.7 grains).

Prepared by the Wm. S. Merrell Co., Cincinnati.

SODIUM *r*-LACTATE ONE-SIXTH MOLAR.—A solution of sodium *r*-lactate one-sixth molar.

Actions and Uses.—Sodium *r*-lactate one-sixth molar is approximately isotonic with the blood and is used in the treatment of acidosis (as such or combined with Ringer's solution) and for the purpose of alkalinizing the urine (for instance, in the treatment of acute urinary tract infections with sulfanilamide, in the treatment of transfusion reactions with hemoglobinuria).

Dosage.—Administered subcutaneously or intravenously. Intravenous solutions should not be administered at a rate greater than 300 cc. per hour (approximately 60 drops per minute) except on specific order of the physician. It can be calculated that each 60 cc. of one-sixth molar sodium *r*-lactate per kilogram of body weight may increase the sodium ion concentration of the blood plasma about 14 millimols (mM) per liter. This corresponds to a rise in bicarbonate concentration sufficient to yield an additional 33 volumes of carbon dioxide per hundred cubic centimeters of blood plasma.

Sodium *r*-lactate solution occurs as a clear, colorless, odorless liquid, possessing a slightly saline taste. The pH of the solution, when determined with a glass electrode, is between 4.8 and 6.0. Moisten a clean platinum wire with the solution and hold in a nonluminous flame; an intense yellow color is imparted to the flame. To 5 cc. of sodium *r*-lactate solution add 1 cc. of diluted sulfuric acid and 1 cc. of potassium permanganate solution and heat; acetaldehyde is evolved. To a 5 cc. portion of sodium *r*-lactate solution add 1 cc. of diluted nitric acid and 1 cc. of silver nitrate solution; no turbidity or precipitate occurs. Ten cc. samples of sodium *r*-lactate solution yield negative tests for arsenic and heavy metals when tested according to the U. S. P. XI method.

A 50 cc. sample of sodium *r*-lactate solution remains colorless after the addition of 3 drops of phenolphthalein solution, and between 1.5 and 2.5 cc. of tenth normal alkali is necessary to turn the solution pink.

Transfer exactly 10 cc. of sodium *r*-lactate solution to a platinum crucible and evaporate to dryness. Heat the residue gently and then gradually raise the temperature until the salt is carbonized, but do not exceed a dull red heat. Cool the mass and moisten with a drop of distilled water. Again heat to dull redness and repeat the procedure until the residue is white. Transfer the cooled crucible and its contents to a beaker and dissolve the residue in 50 cc. of water. Titrate with tenth normal acid, using methyl orange as indicator; not more than 17.2 nor less than 16.5 cc. of tenth normal acid is required. Transfer a 20 cc. sample of sodium *r*-lactate solution to a tared platinum dish and add 3 cc. of sulfuric acid. Evaporate to dryness and incinerate at 650 C. for one hour. The weight of the residue is not less than 0.230 Gm nor more than 0.242 Gm.

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SATURDAY, OCTOBER 25, 1941

CLINICAL STUDIES ON A NEW INFLUENZA VACCINE

Additional clinical evidence is now available concerning the prophylactic value of influenza vaccines. Two influenza A vaccines have been tested by Martin and Eaton¹ of the State Department of Public Health, Berkeley, Calif.: (a) a living vaccine prepared by growing influenza A virus in minced chick embryo suspended in saline solution and (b) a complex non-viable vaccine prepared from chick embryos inoculated with both the PR 8 strain of influenza A virus and the virus of the X strain of canine distemper treated with formaldehyde and prepared according to the technic proposed by Horsfall, Lennette and Rickard.² Both vaccines were given as a single subcutaneous dose, the inoculation occurring about two weeks before an outbreak of acute febrile respiratory disease clinically and serologically diagnosed as influenza A.

In one California institution 416 persons were vaccinated, and there were 4,560 nonvaccinated controls. At a second institution there were 413 vaccinations with 2,487 controls. In the two institutions approximately equal numbers were given the viable monovalent vaccine and the bivalent vaccine of Horsfall, Lennette and Rickard. Briefly summarized, 56 of the 829 vaccinated persons contracted influenza, a morbidity incidence of 6.75 per cent. Among the 7,047 nonvaccinated controls there were 750 cases of influenza, a morbidity incidence of 10.65 per cent. Detailed analyses showed that the two vaccines were equally effective, the Horsfall bivalent vaccine giving slightly better results in one institution, while in the second institution the monovalent vaccine was slightly more effective.

Now Horsfall and his colleagues³ report another clinical study on a considerable scale. About a year ago their complex influenza A and canine distemper vaccine was given as a single subcutaneous injection to volunteers in fifteen institutions in Florida and Alabama. The number of persons vaccinated was

7,907 and the number in the same institutions not vaccinated was 9,688. About four months after the vaccine had been given, epidemics of influenza occurred in ten of these institutions. All cases of influenza which occurred in either the vaccinated or control individuals were recorded. Serum obtained from many of the patients during the acute phase of the disease and again during the convalescent period was subjected to complement fixation and other tests in order to establish a diagnosis in each instance. In the ten institutions there were 1,450 cases of influenza. An etiologic diagnosis could be established in 66⅔ per cent of these cases, while in the remaining cases either one or both serum specimens were unavailable. It was possible, therefore, to calculate with reasonable accuracy the proportion of cases of influenza A in both the vaccinated and the control groups, the recognition being given to the fact that influenza A is only one etiologic variety of the clinical syndrome termed influenza. Since the vaccine used in this study did not contain influenza B virus it was expected that it would not produce an antibody response against influenza B, and this was indeed found to be the case. The incidence of influenza A was 50 per cent lower among the vaccinated groups than among the unvaccinated groups who were living under identical environmental circumstances. Furthermore, the incidence of influenza of unknown cause (presumably not influenza A) showed no significant differences between the vaccinated and the control groups.

The results of this study would indicate, these investigators believe, that the single subcutaneous injection of the complex vaccine against influenza A significantly reduces the incidence of influenza A in the vaccinated group as compared with the control group. Since the complex vaccine used in this study contained inactivated virus, it seems probable that it served only to stimulate the production of antibodies and not to alter other factors which may contribute to a state of relative immunity to influenza A. It is likely, therefore, that the increased clinical immunity observed was attributable to the increased antibody levels possessed by the vaccinated institutional inmates.

Previous investigators⁴ have reported evidence of a slight protection against influenza in persons inoculated subcutaneously with the living virus but have not found evidence⁵ of an active immunity following control vaccination with the non-living (formaldehyde treated) vaccine. However, the evidence now available from the California and the Rockefeller Institute investigators would lead to the conclusion that this complex non-viable vaccine as developed by Horsfall and his co-workers is as effective a prophylactic agent as the

1. Martin, W. P., and Eaton, M. D.: *Proc. Soc. Exper. Biol. & Med.* 47: 405 (June) 1941.

2. Horsfall, F. L., Jr.; Lennette, E. H., and Rickard, E. R.: *J. Exper. Med.* 73: 335 (March) 1941.

3. Horsfall, F. L., Jr.; Lennette, E. H.; Rickard, E. R., and Hirst, G. K.: *Pub. Health Rep.* 56: 1563 (Sept. 19) 1941.

4. Francis, Thomas, Jr., and Magill, T. P.: *J. Exper. Med.* 65: 251 (Feb.) 1937. Stokes, Joseph, Jr.; Chenoweth, Alice D.; Walter, A. D.; Gladen, R. G., and Shaw, Dorothy: *J. Clin. Investigation* 16: 237 (March) 1937.

5. Special Research Council, Special Report No. 228, 1938, p. 141. Taylor, R. M., and Dreguss, Miklos: *Am. J. Hyg., sect. B* 21: 31 (Jan.) 1940.

living virus. Certainly the results obtained by these two groups of investigators based on controlled clinical studies offer the most encouraging evidence of practical applicability of influenza vaccination which has so far appeared in the literature.

SHOTGUN VITAMINS RAMPANT

When Lever Brothers, manufacturers of various soaps and other products, recently announced its entrance into the vitamin field, it joined the vitamin gold rush of 1941, making the California trek of 1848 pale by comparison. There are lush profits in the vitamin business.¹ Enterprising manufacturers of all kinds are climbing on the wagons and taking to the trail. The Vick Chemical Company saw the boom developing; it acquired "Vitamins Plus," against which the Federal Trade Commission moved a year ago. According to the Federal Trade stipulation the promoters of "Vitamins Plus" agreed to cease representing that "lusterless eyes or lack of whiteness of the teeth are generally due to Vitamin A deficiency," that "Vitamin E is known to be capable of preventing sterility or promoting mental or physical vigor," that "foods customarily have but a negligible amount of Vitamin B₁" and that "by the use of 'Vitamins Plus' . . . one may become active, gay, beautiful or charming, or live without a 'let-up' or 'let-down.'" Now "Vitamins Plus" is said to assure the users just beauty and health!

From the Lever Brothers advertisements it is evident that nobody has an exclusive monopoly on panaceas: The "tired and jittery" public is assured that "Vimms are here!" and "Boy—It's Great To Feel Good." "Vimms" ties in, of course, with the government's campaign for adequate nutrition. The ads state: "All of the five vitamins the government says you need daily" and "U. S. Govt. experts say 3 out of 4 need more vitamins and minerals."

As a result of the important advances in our understanding of nutritional problems, made in the last decade, it is evident that an optimal state of health cannot be assured without a dietary sufficiently broad to include a variety of essential elements. Among these are vitamins. However, many elements and substances are necessary for the maintenance of optimal nutrition. And this is the important truth—all the substances required by normal adult human beings can be supplied under ordinary conditions by a balanced diet.

The body of man has not evolved so that he can function efficiently on tablets and food concentrates. His physiology requires the materials essential to health and well-being in the form of food. Synthetic tablets are not a perfect substitute. Foods common to the American dietary properly selected will contribute

everything that foods can give to the maintenance of good health. From an economic point of view, foods are the cheapest source of vitamins and other essential elements. The ingredients of food purchased in the form of pills are wastefully expensive. In these times, when conservation of economic resources is essential, people should remember this important fact. But they must also realize that, in the treatment of diseases, often tablets are advantageous in place of food. The manufacturers of shotgun vitamins do not of course offer their products for disease.

Vitamins are merely important food constituents that have been isolated, concentrated or synthesized. Restricted diets may lack some of these vitamins, and that lack expresses itself in a variety of symptoms. But relief of fatigue and the jitters or the creation of health and beauty will not come from vitamin capsules unless the symptoms have appeared or the beauty has been lost as a result of a specific deficiency. If daily consumption of a good serving of ham, a green vegetable, a glass of milk, a slice of brown bread, an orange and the other constituents of a suitable diet will not maintain the body in a satisfactory state of nutrition, a medical study is needed more than a shot with a shotgun pill of vitamins. A given amount of vitamins, like oil in the crank case of a car, is necessary to insure proper functioning; but the efficiency of the parts is not increased by adding unlimited amounts.

THERAPY OF RHEUMATOID ARTHRITIS

At a conference on therapy of rheumatoid arthritis held by the members of the Departments of Pharmacology and Medicine of Cornell University Medical College and the New York Hospital, Dr. Harry Gold presented a list of some thirty therapeutic measures. Dr. Russell L. Cecil defined rheumatoid arthritis as a chronic disease of the joints characterized in the early stages by pain and swelling of multiple joints and in the latter stages by ankylosis and deformity. Dr. Cecil stated that the theory of focal infection is generally discredited because in many patients the disease develops without any association with foci, and because patients who have had foci of infection removed have obtained only temporary relief, if any. Bee venom, foreign protein therapy, sulfur, iodides, salicylates and many other drugs have all had their vogue and have all been found more or less ineffective. Dr. Cecil emphasized four principles on which to base rational treatment of rheumatoid arthritis. These principles are rest, heat, rehabilitation and drug therapy to relieve pain. Under the last heading he would put salicylates first. Patients with arthritis can go on taking from 40 to 60 grains (2.6 to 3.9 Gm.) of acetylsalicylic acid daily without any apparent injury. Cecil treated 200 patients with gold salts and is enthusiastic about the results. Gold therapy, introduced in 1929 by Forestier in France, was based on two premises, one of which is definitely erroneous and the other doubtful. Forestier and other French

1. In 1938 the American public spent \$100,000,000 for vitamin preparations. In 1937 they spent about half this amount, only 50 per cent of which was sold to or prescribed by physicians. For purposes of comparison, it is pointed out that the balance—\$25,000,000—represented five times the expenditures for vitamin products bought directly by the public in 1935—Schrell, W. H.: J. A. M. A. 115: 851 (Sept. 7) 1940

workers believed that rheumatoid arthritis is a form of tuberculosis and that gold is efficacious in the treatment of tuberculous disease. Drs. Angevine and Rothbard have demonstrated in experiments a bacteriostatic effect of gold salts on the streptococcus and other organisms, both in vivo and in vitro. Other workers have advanced the theory that gold salts act by stimulating the reticuloendothelial system.

The following gold salts have been in use: sodium gold thiosulfate, sodium gold thiomalate (myochrysine) and aurothioglucose (solganol B). All of the efficacious gold salts contain a sulfhydryl radical. The salt is administered in weekly intramuscular injections, the dose at first being 10 mg. and increasing gradually to 100 mg. until a total of from 1 to 1.5 Gm. has been given. After a rest interval of from six to twelve weeks a second series is started. A serious objection to gold therapy is the prevalence of toxic reactions, the most important of which are exfoliative dermatitis, ulcerative stomatitis, toxic jaundice, purpura haemorrhagica and granulocytopenia. Of the 200 patients treated by Cecil, one third showed remission and one third considerable improvement. About one third or more had relapses. He believes that the outlook for gold therapy is promising. He finds that in estimating the effect of the gold therapy the sedimentation rate is of value. When the therapy is effective, the rate tends to return to normal. In the discussion, Dr. D. Murray Angevine called attention to the statement of one authority that from 60 to 75 per cent of arthritic patients will do well if one leaves them alone. He did not think that our knowledge of the etiology of the disease has been advanced by the use of gold salts. In his experimental work Dr. Angevine had seen much damage to the kidneys and livers of many animals treated with gold. Dr. Lewis A. Conner felt that evaluation of any therapy in rheumatoid arthritis was difficult because of natural recessions and periods of temporary relief.

In summing up, Dr. Gold emphasized the importance of physical and mental rest, a well balanced diet and abundant vitamins. The application of heat in various forms is helpful. Physical therapy, fever therapy and blood transfusions, corrective exercise and various orthopedic procedures are useful in appropriate cases. Acetylsalicylic acid appears to be the favorite for the control of pain. Iodides, arsenic and strychnine are of questionable value. Iron does not control anemia, as would be expected, because of the fact that the anemia is not as a rule due to iron deficiency. The value of the removal of tonsils and teeth as foci of infection is open to serious doubt. Vaccines have also made out a bad case for themselves. Dr. Cecil believes that gold salts have solid merit; a more skeptical view of their value was taken by other students of arthritis at this conference. The question was raised whether the use of gold salts may not represent merely another episode in the history of the long list of therapeutic promises for rheumatoid arthritis which have failed to materialize.

Current Comment

ARMED TRUCE IN THE VIRUS INFECTIONS

For many years it has been known that the virus of herpes simplex may remain latent in the human body for indefinite periods. A state of equilibrium between the host and the virus seems to develop. Fever, trauma and actinic irritation of tissue at mucocutaneous junctions appear in some way to upset the balance so that the latent virus produces its herpetic lesion. Sabin and Ward,¹ working at the University of Rochester School of Medicine, have recently demonstrated that the virus of poliomyelitis may likewise be present in active form in the tissues of the monkey without producing progressive manifestations of infection. Passage of the virus from animals in this state of armed truce to other monkeys has given rise to typical paralytic manifestations. Piece by piece the amazing characteristics of viruses are being disclosed. The discovery that certain viruses (the virus of tobacco mosaic disease) may be isolated in crystalline form was startling. The recent observations on virus equilibrium explain many heretofore mysterious aspects of virus diseases.

CASEIN AND SOY BEAN PROTEIN

At the recent Nutrition Conference for Defense in Washington² Professor Murlin emphasized the vast difference between the amount of milk provided in the dietary of the present trainees in the army and that allowed in the first World War. Another speaker pointed out that the large quantities of milk now needed to supply the requirements of the training camps has definitely affected the availability of market milk in those areas. This increased consumption influenced by better nutritional supervision has caused commercial imbalance in other directions as well. Casein, the chief protein of bovine milk, occupies an important place as a sizing for paper, an adhesive for plywood, in water paint, as a plastic, in insecticides and as a leather finish. The growing shortage of this protein has hastened the commercial production of soy bean protein,³ which is one of the most promising substitutes for casein. Ten thousand tons of soy bean protein annually will be required to compensate for the casein shortages. Chemists in the Soy Bean Research Laboratory of the U. S. Department of Agriculture have developed methods for the preparation of high grade protein in commercial quantities, and plans are being made to increase the production. The rapid increase in the quantity of dried and processed milks being sent to Britain further emphasize the importance of securing adequate substitutes for those by-products of the dairy industry which have entered largely into other industries.

1. Sabin, Albert B., and Ward, Robert: *J. Exper. Med.* 72: 557 (June) 1941.

2. National Nutrition Conference for Defense, editorial, *J. A. M. A.* 116: 2598 (June 7) 1941.

3. American Chemical Society, News Edition 19: 945 (Aug. 25) 1941.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

SELECTIVE SERVICE PHYSICIANS WILL CONTINUE TO SERVE

The announcement made under Medical Preparedness in THE JOURNAL, October 18, page 1364, that a single physical examination for selective service registrants would be the procedure to be followed after Jan. 1, 1942 was based on an official release from the National Headquarters of the Selective Service System. Subsequently an announcement has been received to the effect that this original release was premature and that a further statement will be made in the near future indicating the modifications that are to take place in the methods of examination.

LOCATIONS FOR PHYSICIANS IN DEFENSE AREAS

A serious need for additional physicians exists in many vital defense areas. These shortages have arisen because of the great increases in civilian population which have occurred during the year. The needs exist in a large number of states in communities varying in size from small villages to large cities.

The demand for medical care is already so urgent that it should be relatively easy, in many places, to establish practice at once. Furthermore, the coming of winter will result in overtaxing the medical personnel in many other localities where at present the physicians are very near the limit of their capacities.

In most of these defense areas there are defense housing projects in which office space or living accommodations or both may be secured. Surveys in progress have already revealed a number of areas which need physicians, and, as additional areas are surveyed, other important locations will undoubtedly be found.

The United States Public Health Service in cooperation with the Division of Defense Housing, of the Federal Works Agency, which supervises these projects, is interested in acquainting physicians with the needs of these communities. If you are interested in securing more specific information about localities for the establishment of practice, please communicate with me.

(Signed) THOMAS PARRAN
Surgeon General

NOTE:—We are informed that physicians who write in response to this announcement will be sent forms on which to record their training, experience and preference as to parts of the country for practice. Every precaution is to be taken so as not to encourage physicians to remove from localities which are at this time undersupplied with physicians.—Ed.

GOVERNMENT PROVIDES FUNDS FOR TRAINING NURSES AT WAYNE UNIVERSITY

Wayne University, Detroit, announces that the federal government has tentatively allotted to that school \$52,190 for training undergraduate and graduate nurses. This fund will finance a project to provide for increased enrolment for student nurses at Wayne University, the instruction in nursing being carried on at the Providence, Harper, St. Mary's, Children's, Evangelical Deaconess and Herman Kiefer hospitals in Detroit. About \$3,500 of this fund is for training graduate nurses specializing in public health nursing. Wayne University's training program in public health nursing is one of the several curriculums offered for graduate nurses to enable them to participate more effectively in fields of special choice.

UNITED STATES ARMY FLAGS

The silk colors carried by the President, the Chief of Staff, the Secretary of War, the standards carried by all regiments, automobile flags used by general officers, post and storm flags displayed at every Army station, flags used on transports and Army harbor boats, and guidons for troops, batteries and companies, all are made at the Quartermaster Depot in Philadelphia. The manufacture of silk colors and standards at this depot is a specialized art. The stars are made of solid embroidered silk on a hand embroidery machine. The blue fields are placed in frames on a machine provided with many needles which turn out a stitch resembling hand embroidery, the two sides alike. The regimental colors and standards, each with its own coat of arms, and mottoes, are embroidered by hand and as many as thirty different shades of silk are used in embroidering each flag.

ILLINOIS SELECTIVE SERVICE COMMISSION ESTABLISHES DIVISION OF VENEREAL DISEASE

The Illinois Selective Service Commission has established a new Division of Venereal Disease, and a new program has been set up whereby laboratory evidence of venereal disease will no longer be grounds for military rejection in Illinois. Selective Service registrants whose laboratory tests indicate venereal disease will be deferred to Class 1-B and brought under medical treatment in civilian life. Each local draft board will review its rejections and recall the affected registrants for reexamination and, if laboratory examination shows evidence of venereal disease, the selectee will be referred to his physician or to a clinic for treatment. Local advisory board sections are being established in each Illinois city where a venereal disease clinic is in operation. This new program, Dr. Ronald R. Cross, Illinois Director of Public Health, said should aid in checking the spread of venereal disease in Illinois. The chairman of the Selective Service Commission's medical advisory board downstate is Dr. Herman M. Soloway, chief of the division of venereal disease control of the state health department; the Chicago chairman is Dr. Herman N. Bundesen, president of the Chicago Board of Health.

FIFTIETH ANNIVERSARY NUMBER OF THE ASSOCIATION OF MILITARY SURGEONS

The September *Military Surgeon* commemorates the fiftieth anniversary of the founding of the Association of Military Surgeons in the United States. In preparing this issue, Col. Edgar Erskine Hume, M. C., U. S. Army, scanned the fifty-four thousand pages of the *Military Surgeon* that have been published during the half century and thus was able to present a history of the organization, with numerous pictures of past presidents. The founder of the Association of Military Surgeons was Dr. Nicholas Senn, professor of surgery at Rush Medical College in Chicago, and the first meeting of the association was held in that city on Sept. 17, 1891. The issue contains summaries of the proceedings of many of the annual meetings, abstracts of papers and editorials that have appeared in the *Military Surgeon*, the constitution of the organization and other documents. This number is a fitting tribute to the organization and to the numerous military officers who have had a part in the success of this organization.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY

WAR DEPARTMENT

The following additional medical reserve officers have been ordered to extended active duty by the War Department, Washington, D. C.:

BUKANTZ, Samuel C., 1st Lieut, Washington, D. C.
DIXON, Chalmers D., 1st Lieut, Denver
FRANCO, Robert, 1st Lieut., Seattle, Wash
FREDERICK, Lewis Oliver, 1st Lieut, Osborn, Ohio
GANS, Edward Wolf, 1st Lieut, Harlowton, Mont
GEIGER, James Metz, 1st Lieut, San Francisco, Calif
HOILAND, Moses Henry, 1st Lieut, Weehawken, N. J.
INGRAHAM, Edgar S., 1st Lieut, Mercer, Pa

LAW, John H., 1st Lieut, Detroit
MEIGHER, Stephen C., 1st Lieut, New York
PERKINS, Robert Donald, 1st Lieut, Moline, Ill
PROTHRO, Winston Boone, 1st Lieut, Arkadelphia, Ark
RAWLS, Noel Burdett, 1st Lieut, Portland, Ore
RICHARDSON, Howard L., 1st Lieut, Tacoma, Wash
SCOTT, Wirt Stanley, Jr., 1st Lieut, San Francisco
SHWAYDER, Montmore C., 1st Lieut, Fresno, Calif
WEISS, Thomas Edward, 1st Lieut, New Orleans

Orders Revoked

ROMANSKY, Monroe James, 1st Lieut,

SIXTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Sixth Corps Area, which comprises the states of Wisconsin, Illinois and Michigan:

ALLISON, Olaf Will, 1st Lieut, Danville, Ill., Basic Flying School, Emid, Okla
BALLARD, George Pratt, 1st Lieut, Chicago, Ill., Basic Flying School, Emid, Okla
BATES, Alvin F., 1st Lieut, Chicago, 33rd Division, Camp Forrest, Tenn
BERNSTEIN, Alexander M., 1st Lieut, New Orleans, Basic Flying School, Sherman Denison, Texas
BICA, Gaetano A., 1st Lieut, Chicago, 5th Infantry Division, Fort Custer, Mich
CAMP, Edward Hays, 1st Lieut, Joliet, Ill., Sheppard Field, Wichita Falls, Texas
COHN, Arnold Melvin, 1st Lieut, Springfield, Ill., Basic Flying School, Emid, Okla
CONRAD, Cecil Dee, 1st Lieut, Ypsilanti, Mich., Sheppard Field, Wichita Falls, Texas
CUTRERA, Hugo T., 1st Lieut, Chicago, U. S. Army Air Base, Tucson, Ariz
DAILEY, Dee William, 1st Lieut, Elcho, Wis., Basic Flying School, Sherman Denison, Texas
ENTIN, Oscar Louis, 1st Lieut, Chicago, Basic Flying School, Waco, Texas
ESPENSCHEID, John S., 1st Lieut, Danville, Ill., Parks Air College, East St. Louis, Ill.
FORSYTHE, John R., 1st Lieut, Detroit, Basic Flying School, Waco, Texas
FRANCO, Joseph Richard, 1st Lieut, Chicago, Bonham Aviation School, Bonham, Texas
FRANK, Louis S., 1st Lieut, Chicago, Oklahoma Air College, Oklahoma City
FRIEDMAN, Harold S., 1st Lieut, Chicago, Spartan Aircraft Company, Muskogee, Okla
FROSTIC, William Duncan, 1st Lieut, Wyandotte, Mich., Sheppard Field, Wichita Falls, Texas
GALLAGHER, Edward James, 1st Lieut, Chicago, Wilson Bonfils Flying School, Chickasha, Okla
HAFTKOWSKI, Dominic J., 1st Lieut, Chicago, U. S. Army Air Base, Albuquerque, N. M.
HARTLETT, Elvin Mann, Major, Evanston, Ill., Headquarters Illinois State Selective Service, Springfield, Ill.
HENEVELD, Edward Henry, 1st Lieut, Detroit, 5th Infantry Division, Fort Custer, Mich

JOHNSON, Chester T., 1st Lieut, Oak Park, Ill., Braxton Flying Service, Cuero, Texas
JOHNSON, Waid Rayfield, 1st Lieut, Flint, Mich., Sheppard Field, Wichita Falls, Texas
KIEFFER, John Phelps, 1st Lieut, Evergreen Park, Ill., Will Rogers Field, Oklahoma City
LIPTON, Raymond F., 1st Lieut, Detroit, U. S. Army Air Base, Albuquerque, N. M.
MATTES, Max Wolf, 1st Lieut, Detroit, U. S. Army Air Base, Albuquerque, N. M.
McCALL, Harold F., 1st Lieut, Chicago, U. S. Army Air Base, Tucson, Ariz
MOFFETT, James Leo, 1st Lieut, Montfort, Wis., Will Rogers Field, Oklahoma City
MURPHY, Francis C., 1st Lieut, Chicago, Will Rogers Field, Oklahoma City
RAMSEY, Jac Allen, Captain, Alpena, Mich., 5th Infantry Division, Fort Custer, Mich
ROSS, Philip H., 1st Lieut, Chicago, Goodfellow Field, San Angelo, Texas
SHAW, Jesse W., 1st Lieut, Carbondale, Ill., Will Rogers Field, Oklahoma City
SIBRANS, William Albert, 1st Lieut, East Detroit, Mich., Will Rogers Field, Oklahoma City
SNODGRASS, Herbert M., 1st Lieut, Madison, Wis., Basic Flying School, Sherman Denison, Texas
STEVENSON, Edward Lee, 1st Lieut, Ionia, Mich., 5th Infantry Division, Fort Custer, Mich
WARNER, William James, 1st Lieut, Detroit, U. S. Army Air Base, Tucson, Ariz
WARSHALL, Arnold H., 1st Lieut, Chicago, U. S. Army Induction Station, Chicago
WIENER, Morton J., 1st Lieut, Lansing, Mich., Goodfellow Field, San Angelo, Texas
WIGODSKY, Herman Saul, 1st Lieut, Evanston, Ill., Basic Flying School, Emid, Okla
WITUS, Carl, 1st Lieut, Detroit, Basic Flying School, Sherman Denison, Texas
WOODARD, Lawrence E., 1st Lieut, Chicago, Basic Flying School, Waco, Texas
YOUNG, Tommy Richard, 1st Lieut, Mount Carmel, Ill., Sheppard Field, Wichita Falls, Texas

Orders Revoked

RAICHART, William A., 1st Lieut, Berwyn, Ill., 33rd Division, Camp Forrest, Tenn
SHOEMAKER, John Calvin, 1st Lieut, Vassar, Mich., 135th Medical Regiment, Camp Shelby, Miss

ORDERED TO FOREIGN DUTY

ARNOLD, Walter Frank, Lieut, M. C. V. (S) N. R., Long Beach, Calif., Dispensary, Naval Air Station, Pearl Harbor, Hawaii
AYERS, Robert Lawrence, 1st Lieut, M. R. C., Penn Grove, Calif., Fort William McKinley, Philippine Islands
BERTRAM, Harold Frederick, 1st Lieut, M. R. C., Oklahoma City, Sternberg General Hospital, Manila, Philippine Islands
BRADDOCK, William Hallock, Lieut Col, Milwaukee, Philippine Department, Fort Santiago, Manila, P. I.
BRANNAN, Max, 1st Lieut, Miami, Fla., Panama Canal Department, Albrook Field, Canal Zone
de DIEGO, Manuel, Captain, N. G. Cayes, Puerto Rico, Medical Detachment, 162d Field Artillery, Henry Barracks, Cayes, Puerto Rico
EBELING, Walter Wilford, Lieut, M. C. V. (S) N. R., Mount Vernon, Wash., Navy Yard, Pearl Harbor, Hawaii
FLAIG, Julian Vincent, Captain, M. R. C., Schofield Barracks, Hawaii
HAINES, John Wister, 1st Lieut., Philadelphia, Station Hospital, Fort Mills, Corregidor, P. I.
HERMES, Richard Lawrence, 1st Lieut, M. R. C., San Juan, Puerto Rico, Station Hospital, Ponce Air Depot, Ponce, Puerto Rico
HEWLETT, Thomas Hill, 1st Lieut, Corregidor, P. I., Station Hospital, Fort Mills, Corregidor, P. I.
KERN, Clyde Vincent, 1st Lieut, M. R. C., Tulsa, Okla., Fort Stevensburg, Philippine Islands
KRAFT, George Louis, Lieut (j. g.), M. C. V. (G) N. R., Chicago, Naval Air Station, San Juan, Puerto Rico
LAWRY, Lee Llewellyn, Jr., 1st Lieut, M. R. C., Derrick City, Pa., Station Hospital, San Juan, Puerto Rico
MILLER, Julius Yoland, Lieut (j. g.), M. C. V. (G) N. R., Cleveland, Mass., U. S. S. Eric, Balboa Canal Zone
NEIBRIEF, Milton Nelson, 1st Lieut, M. R. C., Brooklyn, Boston Harbor, Field, Puerto Rico
PANG, David Koon Lee, Captain, N. G., Honolulu, Hawaii, 29th Infantry, Schofield Barracks, Honolulu, Hawaii
SCHWAB, William John, Lieut (j. g.), M. C. V. (G) N. R., Proctor, R. I., Naval Operating Base, Guantanamo Bay, Cuba
WELSH, Clyde Lionel, Lieut Comdr., M. C. O. N. R., Seattle, Naval Hospital, Canacao Cavite, Philippine Islands

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status—S 165 has been reported to the Senate providing that an enlisted man of the Army, Navy, Marine Corps and Coast Guard of the United States in the active service whose term of enlistment shall expire while he is suffering disease or injury incident to service and not due to misconduct and who is in need of medical care or hospitalization may, with his consent, be retained in service beyond the expiration of his term of enlistment and entitled to receive at government expense medical care or hospitalization until he shall have recovered to such extent as would enable him to meet the physical requirements for reenlistment or until it shall have been ascertained by competent authority of the service concerned that the disease or injury is of a character that recovery to such an extent would be impossible

Bills Introduced—S 1959, introduced by Senator Walsh, Massachusetts, proposes to amend "An Act to effect needed changes in the Navy ration" so as to permit the use of oleomargarine or butter substitute when climatic or other conditions render the use of butter impracticable H R 5801, introduced by Representative Sutphin, New Jersey, provides for a survey of the resources of the United States in the field of physical education for purposes of initiating a program to enable the youth of the country to participate in supervised physical activities planned to meet their respective needs H R 5828, introduced by Representative Sauthoff, Wisconsin, proposes to amend the Articles for the Government of the Navy by providing that, before directing the trial of any charge by general court martial,

the convening authority shall cause a medical board to be convened to examine the accused Such medical board, it is proposed, shall consist of such number of medical officers, not less than three, as the convening authority may see fit, at least one of whom shall, if practicable, be a psychiatrist This medical board will investigate the mental capacity and condition of the accused, both at the time the offense charged was alleged to have been committed and at the time of the examination, with a view to determining whether or not the accused suffered or suffers any mental defect or derangement H R 5852, introduced by Representative Gearhart, California, provides that, in furtherance of national defense, alcohol or other distilled spirits of a proof strength of not less than 180 degrees may be withdrawn free of tax from receiving cisterns at any registered distillery or from storage tanks in any internal revenue bonded warehouse for transfer to tanks, tank cars or other approved containers, or by pipe line, for use of the United States or any governmental agency thereof

DISTRICT OF COLUMBIA

Bill Introduced—S 1980, introduced by Senator Bilbo, Mississippi, provides that no person shall carry on the business or profession or discharge any duties of an undertaker, mortician, funeral director or embalmer unless there has been issued to him a license by the Commissioners of the District of Columbia The bill undertakes to prescribe the qualifications to be met for applicants before such license may be issued and provides for the revocation of a license for certain causes

WOMAN'S AUXILIARY

California

The Santa Cruz County auxiliary met in May at the Rio Del Mar Country Club Doctors' wives from Camp McQuaide were guests A book review, "Life with Father," was presented by Mrs Frank Cralle

Pennsylvania

The Mifflin County auxiliary recently was extended the courtesy of a tour through the American Viscose Corporation plant at Lewistown The processes were fully explained, starting with the wood pulp of which rayon is made to the finished yarn on spools and in skeins ready to be shipped This plant covers twenty-five acres and is the largest of seven owned by the Viscose Corporation in the United States

South Dakota

Mrs Frederick C Nilsson of Sioux Falls, S D, president of the Woman's Auxiliary to the South Dakota State Medical Association, has presented some historical facts concerning that organization, which was organized on Sept 29, 1910 and has been in regular operation since that date The state auxiliary has the original minutes of the first meeting The South Dakota auxiliary believed that it was the first to organize a state auxiliary Oklahoma, however, presented to the historian of the Woman's Auxiliary to the American Medical Association data which indicate that the woman's auxiliary to the Oklahoma State Medical Association or more correctly, the Oklahoma Territorial Medical Association, was organized in Shawnee on May 15, 1907 Mrs W C Bradford of Shawnee was the first state president This auxiliary continued to meet in annual session for eight years and then ceased to function until its reorganization in 1926 in Oklahoma City, when Mrs Anton M Sanger was elected president

Virginia

Alexandria auxiliary officers for 1941 are president, Mrs C E Arnette, president-elect, Mrs H A Hornthal, vice president, Mrs W E Beattie, secretary, Mrs George Lemeshewsky, and treasurer, Mrs C V Amole The auxiliary assists in the maintenance of a bed for a physician or members of a physician's family at the Blue Ridge Sanatorium It redecorated and helped furnish a doctor's room at the Alexandria Hospital There is a committee in charge of this room During this year they have made a contribution of \$10 to this clinic

Washington

The Pierce County auxiliary held an open meeting recently in Tacoma which was in charge of Mrs G C Trimble, public relations chairman The guest speaker, Dr Leland Powers, city health officer, spoke on "The Recent Poliomyelitis Epidemic in Tacoma and the Severe Problem in Tacoma" There were thirty-five present

The King County auxiliary, of which Mrs W A Millington is president, met in Seattle at the Medical-Dental Auditorium, recently, with seventy-five present This was a public relations meeting in charge of the chairman, Mrs E A Nixon Mr E A Anderson executive secretary of the Washington State Medical Association, gave a report on the recent legislature Mrs Austin De Grees, an auxiliary member, showed colored movies of her trip to Mexico

The Spokane County auxiliary had one hundred in attendance at the open public relations meeting recently at the Woman's Athletic Club Questions on health, sent in by woman's clubs, were answered by Drs R G Boyd, Alfred Taylor, Donald Palmer and Clarence A Veasey Jr

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ADDITIONAL MEDICAL COLLEGE NEWS AND ARTICLES APPEAR IN THE STUDENT SECTION, PAGE 1475.

ARKANSAS

Personal.—Dr. Guy P. Slaughter, Little Rock, has been named field consultant in obstetrics to the state board of health. —Dr. Barnett P. Briggs, Little Rock, has been appointed acting medical director of the crippled children's division of the state department of public welfare.

Society News.—The Cleveland County Medical Society has disbanded under this name and has affiliated with the Jefferson County Medical Society. The latter society was addressed at its September meeting in Pine Bluff by Drs. Thomas D. Moore, Memphis, Tenn., on "Ureteral Kinks and Strictures," and Robert Lyle Motley, Memphis, "Indigestion." —Among others, Dr. Henry King Wade, Hot Springs National Park, addressed the Ouachita County Medical Society, September 4, in Camden on "Carcinoma of the Prostate."

CALIFORNIA

Dr. Kellogg Retires as Chief of Laboratories.—Dr. Wilfred H. Kellogg, Berkeley, chief of the division of laboratories of the California Department of Public Health and credited with being the first man to make a bacteriologic diagnosis of plague in the United States, retired from his activities September 3, according to *Western Public Health*. A native of Arkansas City, Kan., 1871, Dr. Kellogg graduated at the University of California Medical School, San Francisco, in 1896. He was bacteriologist of the San Francisco Department of Health, 1900-1903; state bacteriologist in 1908; acting assistant surgeon, U. S. Public Health Service, detailed for plague investigations in Venezuela, 1909-1911; formerly clinical instructor in hygiene and public health, Stanford University School of Medicine, San Francisco; subsequently assistant clinical professor of preventive medicine and hygiene, University of California Medical School, associate clinical professor and associate clinical professor of preventive medicine, emeritus. He was secretary and executive officer of the state board of health from 1918 to 1920 and director of laboratories, department of public health of San Francisco, 1912 to 1917.

COLORADO

Society News.—The Medical Society of the City and County of Denver devoted its meeting October 7 to a symposium on pain. The speakers and the aspects they considered were Drs. Abe Ravin, physiology; William R. Lipscomb, William M. Bane and Rex L. Murphy, head pain, and Luman E. Daniels, diseases of the peripheral nerves and spinal cord.

State Medical Election.—Dr. Ralph S. Johnston, La Junta, was chosen president-elect of the Colorado State Medical Society at its annual meeting in September and Dr. Guy C. Cary, Grand Junction, was installed as president. Other officers include Drs. Edward R. Mugrage, Denver, vice president; John S. Bouslog, Denver, constitutional secretary, and William A. Campbell Jr., Colorado Springs, treasurer. Mr. Harvey T. Sethman, Denver, is the executive secretary.

GEORGIA

University News.—Benedict E. Abreu, Ph.D., instructor in pharmacology, University of Oklahoma School of Medicine, Oklahoma City, has been appointed assistant professor of pharmacology at the University of Georgia School of Medicine, Augusta. William F. Alexander, Ph.D., and Encil Morton Bradley, Ph.D., instructors in anatomy, Louisiana State University School of Medicine, New Orleans, have been appointed to assistant professorships.

Society News.—The Fulton County Medical Society, Atlanta, was addressed, October 6, by Drs. George A. Williams on "An Improved Vehicle for Medication of the Vagina" and Linus J. Miller and Hayward S. Phillips, "Use of Sodium Pentothal in Combination with Other Anesthetic Agents." All

are from Atlanta. —Dr. Allen H. Bunce, Atlanta, president of the state medical association, discussed "The Medical Association of Georgia" before the Fifth District Medical Society in Atlanta, October 20. Other speakers included Dr. Louis L. Williams Jr., Atlanta, Ga., medical director, U. S. Public Health Service, liaison officer, Fourth Corps Area, on "Public Health Work in Relation to National Defense."

IDAHO

New Health Unit in Boise.—A new city-county public health unit has been established in Boise and Ada County. Dr. Gustavus Denton Bock, U. S. Public Health Service, Washington, D. C., has been appointed director with offices at 415 Capitol Securities Building, Boise.

ILLINOIS

Postgraduate Conference.—The Illinois State Medical Society will conduct a postgraduate conference in the Eighth Councilor District at the Hotel Wolford, Danville, November 6. Dr. Melvin L. Hole, Danville, president of the Vermilion County Medical Society, will preside. Included on the program will be:

Dr. Frederick H. Falls, Chicago, Management of Prolonged Labor.
Dr. John R. Vonachen, Peoria, Present Status of Vitamin Therapy.
Dr. Charles E. Galloway, Evanston, Ill., Office Gynecologic Procedure or Treatment.
Dr. M. Herbert Barker, Chicago, Nephritis.
Dr. Lee C. Gatewood, Chicago, Medical Management of Upper-Gastrointestinal Tract Ulcer.
Dr. Raymond W. McNealy, Chicago, Surgical Management of Upper-Gastrointestinal Tract Ulcer.

Dr. Robert S. Berghoff, Chicago, will conduct a heart clinic.

Chicago

Meeting of Women's Medical and Bar Associations.—Branch number 2 of the American Medical Women's Association met jointly with the Women's Bar Association of Illinois, October 9, at the Chicago Bar Association. Dr. Carroll C. L. Birch discussed "Nonpaternity" and Mr. Royal W. Irwin, "The Expert Witness."

Dr. Cutter Honored.—Dr. Irving S. Cutter, dean emeritus of Northwestern University Medical School, was honored at the annual Founders' Day ceremony, October 6. An honorary degree of doctor of science was conferred on Dr. Cutter by Franklyn B. Snyder, LL.D., president of Northwestern University, and his portrait was unveiled in the Archibald Church Library. Leslie B. Arey, Sc.D., Robert Laughlin Rea professor of anatomy, presided and Dr. James Roscoe Miller, the new dean of the medical school, reviewed Dr. Cutter's service to the school. Dr. Cutter had been dean of Northwestern from July 1925 until his retirement from that position this year.

The First Kretschmer Memorial Lecture.—Dr. John H. Lawrence, assistant professor of medicine, University of California Medical School, San Francisco, will deliver the first Edwin R. Kretschmer Memorial Lecture of the Institute of Medicine of Chicago at the Palmer House, November 11. His subject will be "Studies on Leukemia and Allied Diseases with Artificial Radioactivity." Dr. and Mrs. Herman L. Kretschmer established the Edwin R. Kretschmer Memorial Fund in June this year in memory of their son, who died in February. Income from the fund is to be used for research lectures on myelogenous leukemia and for research on blood dyscrasias.

Branch Meetings.—The South Side Branch of the Chicago Medical Society was addressed, October 16, by Drs. Edward L. Compere on "Fractures of the Wrist"; Horace P. Stimson, "Fractures of the Ankle," and Paul C. Bucy, "Traumatic Injuries of the Skull and Brain." —The Northwest Branch devoted its meeting, October 17, to a symposium on diseases of the gallbladder with the following speakers: Drs. Andrew C. Ivy, Clifford J. Barborka and Raymond W. McNealy. —Dr. Israel Davidsohn and members of the staff of Mount Sinai Hospital conducted a clinical pathologic conference before the Douglas Park Branch, October 17. —At a meeting of the Jackson Park Branch, October 16, Dr. James Roscoe Miller, dean of Northwestern University Medical School, discussed "Problems of the Medical Schools in the Present Emergency." Drs. John H. Mohardt, James K. Stack and Harvey S. Allen discussed, respectively, the influence of the war on treatment of chest and abdominal wounds, peripheral wounds and the treatment of burns. —Dr. Archibald L. Hoyne discussed encephalitis before the Stock Yards Branch, October 16.

INDIANA

Personal.—An oil portrait of the late Dr. James O. Parramore, first superintendent of the Lake County Tuberculosis Sanatorium, Crown Point, was recently unveiled in the sanatorium. In the future the hospital will be known as the James O. Parramore Hospital.—Dr. Charles P. Anderson, Durham, N. C., has been appointed medical director of the Gary school board to succeed Dr. Otis B. Nesbit, retired.

State Medical Election.—Dr. Carl H. McCaskey, Indianapolis, was chosen president-elect of the Indiana State Medical Association at its recent meeting in Indianapolis. Dr. Albert M. Mitchell, Terre Haute, will end his term as president January 1, when he will be succeeded by Dr. Maynard A. Austin, Anderson. French Lick was selected as the place for the 1942 meeting.

Society News.—The Tippecanoe County Medical Society was addressed in Lafayette, September 9, by Dr. Parke G. Smith, Cincinnati, on "Ureteral Injuries."—Dr. Charles L. Mahoney, Terre Haute, discussed "Treatment of Commoner Diseases and Injuries of the Eye" before the Greene County Medical Society in Linton, September 11.—The Eleventh Indiana Council District Medical Association was addressed, October 8, in Logansport by Drs. Harry E. Mock, Chicago, on "Management of Skull Fractures—Report of Nationwide Survey of 6,000 Cases"; Clifford L. Williams, Logansport, "Nervous and Mental Cases in General Practice," and John R. Thrasher, Indianapolis, "Neurosyphilis."—Dr. Raphael Isaacs, Chicago, discussed "Blood Changes in Some Common Diseases of Diagnostic Value" before the Lake County Medical Society in Hammond, October 10.

MAINE

Clinical Session.—The Maine Medical Association held its annual fall clinical session in Portland, October 16-17. Clinics were held at the Maine General Hospital, Maine Eye and Ear Infirmary and Children's and Queen's hospitals. Thursday evening was given over to the regular meeting of the Cumberland County Medical Society with the principal speaker, Dr. Walter E. Tobie, Portland, discussing "An Old Fashioned Medical School." At the concluding session, Friday afternoon, Dr. Clarence Guy Lane, Boston, spoke on "Occupational Dermatoses."

MICHIGAN

Hospital News.—Mount Carmel Mercy Hospital, Detroit, broke ground on September 26 for a six story, two hundred bed addition. The new wing will include operating rooms of various types, an enlarged laboratory and pharmacy facilities and an auditorium with a seating capacity of four hundred. The addition will bring the bed capacity of the hospital to six hundred.

Symposium on Sulfathiazole and Sulfadiazine.—The Wayne County Medical Society, Detroit, devoted its meeting, October 13, to a symposium on sulfathiazole and sulfadiazine. Dr. Gordon B. Myers gave the introduction. Other speakers were Drs. Alvin E. Price on "Use in Pneumonia"; Milton R. Weed, "Use in Staphylococcal and Streptococcal Infections"; Ira Muir Clapper, "Use in Pyelonephritis," and Paul H. Noth, "Toxicity." All are from Detroit.

New Division of Pharmacologic Research at Parke, Davis & Co.—Dr. Carl C. Pfeiffer, formerly associate professor of pharmacology and therapeutics, Wayne University College of Medicine, Detroit, has been placed in charge of a new section for pharmacologic research at Parke, Davis & Co. Earl R. Loew, Ph.D., formerly assistant professor of physiology at Wayne, has been appointed research pharmacologist. According to *Science*, both men will continue to lecture at the medical school.

MINNESOTA

Advisory Committee Named to Mental Hygiene Program.—Four members of the Minnesota Society of Neurology and Psychiatry have been appointed in an advisory capacity to the new program of mental hygiene and mental testing in the state division of public institutions. They are Drs. John C. McKinley, Minneapolis; Frederick P. Moersch, Rochester; Ernest M. Hammes, St. Paul, and Lawrence R. Gowan, Duluth. Dr. David E. McBroom, medical superintendent of the Minnesota Colony for Epileptics, Cambridge, became director of the program on September 1.

Personal.—A bronze plaque bearing the likeness of Dr. James L. Adams, pioneer physician of Morgan, was unveiled there in September, the gift of friends. Mounted on a massive granite shaft, the plaque is the work of Amerigo Brioschi,

St. Paul. In addition to the name James L. Adams, the inscription reads "A pioneer doctor. Service to his people filled the life of this man without thought of personal gain." Dr. and Mrs. Adams and their daughters came from their home in Van Nuys, Calif., to be present at the unveiling.—Residents of Sherburn held an open house in the community hall, September 14, to honor Dr. Robert C. Farrish on his completion of forty years in the practice of medicine.—Dr. Waltman Walters, Rochester, Minn., has been named a member of the National Advisory Cancer Council, succeeding Dr. James B. Murphy of the Rockefeller Institute.—Dr. Paul W. Kabler, Minneapolis, has been granted leave of absence for one year from his position as assistant chief of laboratories, division of preventable diseases, Minnesota State Board of Health, to do postgraduate work at the Harvard Medical School, Boston, according to *Minnesota Medicine*.

MISSOURI

Exhibit to Commemorate Death of Paracelsus.—The St. Louis Medical Society announces that its collection of "Paracelsica" will be used in a special display during the meeting of the Southern Medical Association in St. Louis, November 10-13, to commemorate the four hundredth anniversary of the death of Paracelsus (Theophrastus Bombast von Hohenheim, 1493-1541). The collection will be exhibited in the society's library. It is said to be the largest collection of Paracelsica in the Western Hemisphere. The only known larger assemblage of similar works and articles was that of the late Prof. Karl Sudhoff at Leipzig, Germany, the fate of which is now unknown on this side of the Atlantic, the librarian of the St. Louis Medical Society announces. There are more than four hundred numbers in the society's collection, part of which was shown in May before the American Association of the History of Medicine at Atlantic City and later at the Johns Hopkins Institute of Medical History, Baltimore.

Society News.—Dr. Peter G. Danis discussed "Recent Observations on the Etiology, Course and Treatment in Icterus and Anemia of the Newborn" before the St. Louis Medical Society, September 23, and Dr. Harry E. Wachter presented a "Statistical Study of the Incidence and Familial Tendency of the Interrelated Clinical Types of Anemia of the Newborn with Icterus." Both are of St. Louis. The society will be addressed on October 28 by the following members of the staff of the University of Missouri School of Medicine, Columbia: Max M. Ellis, Sc.D., "Some Phases of Arsenic Distribution, Storage and Toxicity"; Drs. David V. LeMone, "Use of X-Ray Therapy in Inflammations," and Dan G. Stine, "The Vagohypotonic Individual."—Carl R. Moore, Ph.D., professor of zoology, University of Chicago, Chicago, discussed "Physiology of the Testis and Application of the Male Sex Hormone" before the Kansas City Academy of Medicine on October 17.—Dr. James Barrett Brown, St. Louis, discussed "Plastic Surgery of the Head and Neck" before the St. Louis County Medical Society, September 24.—Dr. Harold E. Petersen, St. Joseph, discussed "Anoxemia in the Newborn" before the Buchanan County Medical Society in St. Joseph, October 1.—Dr. Daniel L. Sexton discussed "The Syndrome of Anterior Pituitary Failure" before the St. Louis Trudeau Club October 2.

NEW JERSEY

Society News.—Dr. Harold W. Jones, Philadelphia, addressed the Essex County Medical Society, Newark, October 9, on "Value of Blood and Plasma in Transfusion."—Dr. Hugo Roesler, Philadelphia, addressed the Morris County Medical Society, Morris Plains, October 16, on "Bedside Diagnosis and Treatment of Disturbances of Rate and Rhythm."—Dr. Ralph Colp, New York, will address the New Jersey Gastro-Enterological Society in Jersey City, December 1, on "Surgical Problems in Benign Lesions of the Small Intestine and Malignant Lesions of the Large Bowel."—Dr. Roscoe W. Teahan, Philadelphia, addressed the Cumberland County Medical Society, Bridgeton, October 14, on "Clinical Aspects of Superficial Cancer."—Dr. Bernard I. Comroe, Philadelphia, addressed the Camden County Medical Society, Camden, October 7, on "Practical Pointers in Treatment of the Arthritic Patient."—A symposium on poliomyelitis was presented at a meeting of the Bergen County Medical Society at Bergen Pines, October 14, by Drs. Philip M. Stimson, New York; Joseph R. Morrow, Ridgewood; David F. Reilly, Ridgewood; Nelson C. Policastro, Hackensack, and Frederick G. Dilger, Hackensack.

NEW YORK

Outbreak of Dysentery.—Thirty-five cases of dysentery caused by *Bacterium dysenteriae* Flexner, with five deaths, occurred in September in an institution for the aged in Niagara County, *Health News* reports. The first attack occurred on September 4 and two others on September 8. All the patients were women who had been roommates of another woman who had been ill in August. The last attack occurred on September 21. The 5 patients who died were aged and infirm persons who had been confined to bed before the onset of this illness, it was said.

District Meeting.—The Second District Branch of the Medical Society of the State of New York will meet in Garden City, October 30. A symposium on industrial medicine will be presented by Drs. Cassius H. Watson, New York, who will discuss preemployment examination; Irving Gray, Brooklyn, occupational diseases; Samuel Potter Bartley, Brooklyn, prevention of infection in injury; Henry H. Kessler, Newark, N. J., "Rehabilitation," and Mr. Murray Nathan, Albany, "Placement of the Handicapped." In the afternoon Dr. Frank H. Lahey, Boston, President of the American Medical Association, will give an address on "Diseases of the Thyroid Gland." Dr. Samuel J. Kopetzky, New York, president of the state medical society, will make an address at a luncheon meeting of the Woman's Auxiliary.

New York City

Promotions at Long Island College.—The following promotions on the faculty of Long Island College of Medicine were recently announced:

Dr. Fred L. Moore, professor of preventive medicine and community health, succeeding Dr. Alfred E. Shipley.

Dr. Ralph M. Beach, professor of clinical obstetrics and gynecology, succeeding Dr. O. Paul Humpstone.

Dr. Louis C. Johnson, clinical professor of medicine.

Dr. Milton B. Handelsman, Milton B. Plotz, Charles G. Williamson and Burton L. Zohman, assistant clinical professors of medicine.

Drs. William H. Field and David Dexter Davis, assistant clinical professors of surgery.

Lectures on Disease in the Aged.—The Home for Aged and Infirm Hebrews of New York announces six clinical lectures on "Disease of the Aged" for the medical profession to be given by Dr. Frederic D. Zeman, attending physician to the home. The series will be given on successive Thursdays as follows:

November 6, The Clinical Picture of Disease in the Aged.

November 13, Cardiovascular Disorders in Advanced Age.

November 27, Neoplastic Diseases in Old Age.

December 4, The Mind and Its Disorders in the Old.

December 11, Surgery After Sixty.

December 18, The Physical and Mental Hygiene of Old Age.

PENNSYLVANIA

Psychiatric Meeting.—The Pennsylvania Psychiatric Society held its third annual meeting, October 9, at the Hotel William Penn, Pittsburgh. Lieut. Col. William C. Porter, Washington, D. C., M. C., U. S. Army, spoke on "Psychiatry and the National Defense."

Philadelphia

Conferences on School Health.—The American Academy of Pediatrics will sponsor a series of meetings on school health for parents, October 27-29, in selected schools in Philadelphia. The meetings will be developed by the academy's committee for cooperation with nonmedical groups, the school authorities and the parent-teacher organizations. The program will consist of panel discussions by physicians, a motion picture and a forum for health questions. Dr. Ernest L. Noone, Drexel Hill, is chairman of the Pennsylvania committee on cooperation with nonmedical groups.

Testimonial Dinner to Dr. Meeker.—George H. Meeker, Ph.D., dean emeritus of the University of Pennsylvania Graduate School of Medicine, was honored at a testimonial dinner, September 29, marking his retirement as dean. Dr. George M. Coates was chairman, and Dr. George Morris Piersol, toastmaster. Thomas S. Gates, LL.D., president and Dr. Alfred N. Richards, vice president for medical affairs, spoke for the university. Dr. William R. Nicholson for the graduate school and Dr. George E. Pfahler for the Medico-Chirurgical College of Philadelphia, where Dr. Meeker taught before the school was taken over by the university. Other speakers included the deans of the five medical schools in Philadelphia, the director of the department of public health and Dr. Meeker. Dr. Meeker took his Ph.D. degree at Lafayette College, Easton, Pa., and the degrees of Pharm.D. and D.D.S. at the Medico-Chirurgical College. He has received honorary degrees from Ursinus (Collegeville, Pa.), Lafayette and Villanova (Pa.) colleges and from the University of Pennsylvania. He taught at the Medico-

Chirurgical College from 1897 to 1916 and was professor of chemistry in the University of Pennsylvania School of Medicine from 1916 to 1940. He established the graduate school in 1918 and was dean from its opening in 1919 until his retirement this year. From 1924 to 1928 he was director of the Graduate Hospital.

WASHINGTON

New Health Unit.—A health unit has been established in Kitsap County, with headquarters in Bremerton. Dr. Harold M. Graning of the U. S. Public Health Service, San Francisco, organized the unit. Dr. Russell H. Wilson, Bremerton, also lent by the public health service, was to take over the department when Dr. Graning was recalled to active duty with the service.

Society News.—A symposium on treatment of shock was presented at a meeting of the Spokane County Medical Society, Spokane, October 9, by Drs. Robert J. Kearns, Alexander R. MacKay, Russell B. Hanford, William S. Butts and George A. C. Snyder. All are from Spokane. Speakers at a meeting of the King County Medical Society, Seattle, September 15, were Drs. Brien T. King, Charles B. Ward and Sylvester N. Berens, who discussed postoperative exophthalmos; Charles D. Kimball and Nathan K. Rickles, stillbirth.

GENERAL

Prize in Thoracic Surgery.—The American Association for Thoracic Surgery announces that the Rose Lampert Graft Foundation prize of \$250 will be awarded in 1942 for the best paper dealing with the physiology, pathology, anatomy or therapy of the chest. The competition is open to nonmembers of the association as well as to members. The paper should be submitted to Dr. Richard H. Meade Jr., 2136 Pine Street, Philadelphia, before Feb. 1, 1942. Papers should not bear the name of the author but should be accompanied by an envelope enclosing the name.

Röntgen Ray Election and Award of Medal.—Dr. Ralph S. Bromer, Bryn Mawr, Pa., was chosen president-elect of the American Röntgen Ray Society at its annual meeting in September in Cincinnati, and Dr. William M. Doughty, Cincinnati, was installed as president. Other officers include Drs. Frederick W. O'Brien, Boston, and Fred J. Hodges, Ann Arbor, Mich., vice presidents; Harold Dabney Kerr, Iowa City, Iowa, secretary; James B. Edwards, Leonia, N. J., treasurer. Dr. John H. Lawrence, assistant professor of medicine, University of California Medical School, San Francisco, and in charge of medical investigations with the cyclotron at the university, who gave the Caldwell lecture at this meeting, was presented with the annual medal of the society.

Lectures by British Psychiatrist.—Dates for a series of lectures in the United States and Canada by Dr. Robert D. Gillespie, London, psychiatric specialist of the Royal Air Force of Great Britain, have been announced by the Salmon Committee on Psychiatry and Mental Hygiene of the New York Academy of Medicine. Dr. Gillespie will deliver the Salmon Lectures at the Academy, November 17-18, and in several other cities will speak under the auspices of the Salmon Committee and local organizations. The cities and dates are Toronto, Ont., November 19, Chicago November 21, New Orleans November 22, San Francisco November 27 and Philadelphia November 30. Dr. Gillespie will also confer with the U. S. Army and Navy Joint Committee on Recreation and Welfare. The general subject of his lectures will be "Psychoneuroses in Peace and War and the Future of Human Relationships."

Resources for Civilian Defense.—The U. S. Director of the Office of Civilian Defense, Mayor La Guardia of New York, and the chairman of the American National Red Cross, Mr. Norman H. Davis of Washington, D. C., issued a joint statement recently urging state and local defense councils to acquaint themselves with the resources of local Red Cross chapters in providing food, shelter, clothing, nursing care, transportation and other basic necessities and to integrate these resources into the local program. Duplication of trained and experienced personnel and of available supplies of the Red Cross should be avoided except where supplementation is essential to meet the anticipated needs of the community. The statement emphasizes that state and local defense councils are the official agencies responsible for the coordination of all available resources which may be required for civilian protection in the event of belligerent action.

Motion Picture on Syphilis.—A motion picture film in natural color and sound on the subject of syphilis has just been announced by the U. S. Public Health Service, Washington, D. C. The picture, produced for physicians and medical

students, is in three parts: (1) the diagnosis of early syphilis, (2) the diagnosis of late and latent syphilis, (3) the management of syphilis. Each part of the picture is complete in itself, although the three parts together form an interlocking presentation. Thus when time for the entire film is not available at any one medical meeting or in teaching medical students, one or more parts may be used by itself. The film is particularly adapted for such meetings and is of especial importance in teaching undergraduates and in postgraduate courses. The film is available for either purchase or loan from the U. S. Public Health Service. The following are listed as the medical consultants:

Harold N. Cole, M.D., Cleveland.
Joseph E. Moore, M.D., Baltimore.
Paul A. O'Leary, M.D., Rochester, Minn.
Thomas Patran, M.D., Surgeon General, U. S. P. H. S., Washington, D. C.
Francis E. Seneer, M.D., Chicago.
John H. Stokes, M.D., Philadelphia.
Lida J. Usilton, M.A., U. S. P. H. S., Washington, D. C.
Raymond A. Vonderlicke, M.D., Assistant Surgeon General, U. S. P. H. S., Washington, D. C.

Look Out for Check Counterfeiter.—Cooperation is requested in the apprehension of one Marvin Levinsohn, alias Martin Davis, passer of counterfeit checks on the "Quarter-master Bank of the United States." Levinsohn is suffering from tuberculosis and periodically seeks pneumothorax treatments. He victimized a physician in Philadelphia with a check for \$14 receiving \$9 in change, the fee being \$5 for the treatment. The physician said Levinsohn is in need of such treatments at least once every three weeks. Levinsohn also defrauded a physician in New York on September 23. The



physician made a fluoroscopic examination and gave him hypodermic injections. He accepted Levinsohn's check for \$14 and gave him \$11 in cash. Levinsohn insisted that the physician examine his credentials and warned him to be careful in accepting army checks. In all instances in which he passed checks, Levinsohn seems to have used the one amount of \$14. Levinsohn was arrested on March 21, 1938 in Providence, R. I., and sentenced to three years in Lewisburg Penitentiary for negotiating counterfeit checks purporting to have been issued by the Finance Department, U. S. Army. He was first arrested on Feb. 18, 1929 in Baltimore for passing similar checks and apprehended on Oct. 4, 1933 in Philadelphia on the same charge. In each instance he surrendered to army authorities as a deserter. One alias he used was "L. J. Marsden, Lt. Col., Finance Dept., U. S. A." In his former operations he changed the name of the payee in typing out the checks, the amount EXACTLY FOURTEEN DOLLARS AND NO CENTS being typed with a red ribbon. This legend on the new checks is also typed in red. Levinsohn is about 41 years of age, about 5 feet 8 inches tall and weighs about 135 pounds. He has a long nose and on occasion wears a small dark mustache. He is a convincing talker and usually appears in an army uniform. Physicians are urged to notify the U. S. Secret Service office in their district should Levinsohn come to their attention.

Orthopedic Nursing Advisory Service.—The National Foundation for Infantile Paralysis has given a grant to the National Organization for Public Health Nursing and the National League of Nursing Education for a joint advisory service in orthopedic nursing, to be available to nurses in all fields. The orthopedic service of the National Organization for Public Health Nursing, financed by the National Foundation for Infantile Paralysis, now becomes a joint service with the National League of Nursing Education and will be sponsored by the Joint Council on Orthopedic Nursing of the two

organizations. Representation from the league has been added to what was formerly the committee on orthopedic scholarships of the National Organization for Public Health Nursing, and the joint committee will now administer the scholarships of both organizations. According to an announcement, the purpose of the joint service is:

1. To encourage nurses with desirable qualifications to prepare themselves for the field of orthopedic nursing, especially for positions in teaching and supervision.
2. To stimulate better use of facilities and resources for teaching orthopedic nursing in hospitals, public health nursing agencies and universities.
3. To aid in the development of centers where nurses can be sent to practice orthopedic nursing under supervision.
4. To prepare educational material in orthopedic nursing.
5. To give assistance concerning content and method of staff education in orthopedic nursing.

LATIN AMERICA

Latin American Visitors to Health Meeting.—The following public health officials from the American republics were guests of the United States government at the meeting of the American Public Health Association in Atlantic City, N. J., October 14-17. According to an announcement from the Office of the Coordinator of Inter-American Affairs, Washington, D. C., the visitors, after a visit to the Capitol, will be taken on a tour of the United States public health and medical institutions by members of the American Public Health Association and representatives of the Pan American Sanitary Bureau. The group includes:

- Dr. Hugo D'Amato, secretary of national department of health, Buenos Aires, Argentina.
- Dr. Abelardo Ibáñez Benavente, minister of public health, La Paz, Bolivia.
- Dr. João Barros Barreto, director general of public health, Rio de Janeiro, Brazil.
- Dr. Salvador Allende, minister of health and social welfare, and Dr. Alejandro Flores, adviser to the minister of health and social welfare, Santiago, Chile.
- Dr. Roberto Franco, counselor of the Colombian Embassy in Washington, and Dr. Juan A. Montoya, member of National Institute of Health, Bogotá, Colombia.
- Dr. Mario Luján, secretary of public health and social welfare, San José, Costa Rica.
- Dr. Domingo Ramos, minister of national defense, and Dr. Sergio M. García-Marruz, minister of public health, Cuba.
- Dr. Wenceslao Medrano, minister of health and social welfare, Ciudad Trujillo, Dominican Republic.
- Dr. Juan A. Montalván, assistant director of health, Guayaquil, Ecuador.
- Dr. Victor Sutter, national director of health, San Salvador, El Salvador.
- Dr. Carlos Estévez, director general of public health, Guatemala City, Guatemala.
- Dr. Rulx León, formerly undersecretary of public health, Port-au-Prince, Haiti.
- Dr. Pedro Ordóñez Díaz, national director of public health, Tegucigalpa, Honduras.
- Dr. Mario Quiñones, secretary of department of health, and Dr. Angel de la Garza Brito, director of school of public health, Mexico City, Mexico.
- Dr. Luis M. Debayle, national director of public health, Managua, Nicaragua.
- Dr. Carlos Brín, Ambassador of Panama to the United States, Washington, D. C.
- Dr. Raúl Peña, director of public health, Asunción, Paraguay.
- Dr. J. M. Estrella Ruiz, director of public health, Lima, Peru.
- Dr. Juan C. Mussio Fournier, minister of public health, Montevideo, Uruguay.
- Dr. A. Castillo Plaza, director of public health, Caracas, Venezuela.

FOREIGN

Jewish Physicians Restricted in Unoccupied France.—The New York Times reported recently that a decree was issued in Vichy, France, September 6, setting the proportion of Jewish to non-Jewish physicians at 2 per cent. Exemption is provided for Jews who have rendered signal service to France, the dispatch said. The law affects Jews of French nationality; those of foreign birth were barred from practice several months ago.

Personal.—Sir John H. Hebb has retired from the positions of director general of the emergency medical service of the Ministry of Health and director general of medical services of the Ministry of Pensions, the *British Medical Journal* reports. His successor at the Ministry of Health is Prof. Francis R. Fraser, who has been acting in that capacity for some time, it was said. Sir William Wilson Jameson, chief medical officer of the Ministry of Health, will continue to be responsible for the coordination of the emergency medical and hospital services with the general medical and hospital services of the ministry, according to the journal. Sir John Hebb has agreed to continue to make his services available to the Ministry of Pensions.—Dr. Winifred C. Cullis, professor of physiology at the London School of Medicine for Women, has retired with the title of emeritus. She has been succeeded by Dr. Esther M. Killick, lecturer in industrial physiology at the London School of Hygiene and Tropical Medicine.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 23, 1941.

Can Sea Water Be Used to Quench Thirst?

The indiscriminate sinking of ships by submarines and the ignoring of the regulations of international law for the protection of the passengers and crew have revived an old problem. The survivors crowd into open boats, often with a supply of drinking water inadequate for the days which may elapse before rescue. The *British Medical Journal* recalls that in its issue of Nov. 15, 1924 a surgeon, Mr. W. Bernard Secretan, wrote concerning two letters which had appeared in the issue of Feb. 16, 1918 advocating rectal injections of sea water for the alleviation of thirst. One was written by Mr. Morley Roberts, to whom the idea occurred in 1910. He recommended that a Higginson syringe should form part of a lifeboat's equipment. The other correspondent was a surgeon, Mr. George Wherry, of Cambridge, who independently suggested the slow injection of sea water. Secretan asked "Is hypertonic saline or a saturation akin to salt water tolerated by the bowel, and will water be absorbed from it in the colon, as in the case of normal saline; or will it produce, as in the case of purgative salts held in hypertonic solution in the intestine, a flow of fluid from the tissues into the bowel?" The *British Medical Journal* is unable to answer the question but states that a pharmacologist to whom it was referred said that the body would be bound to lose water on the transaction, with intensification of thirst, because the highest recorded concentration of sodium chloride in the urine after taking by mouth large amounts of concentrated salt solution was 1.6 per cent, whereas sea water contains 2.7 per cent sodium chloride.

In the *Times* other suggestions are made. One is that every lifeboat should be equipped with a still, but it has not been worked out whether the apparatus and its fuel would be more economical than the same weight and bulk allotted to drinking water such as every lifeboat carries. Another correspondent remarks that when perspiration is heavy slightly salt water is a more refreshing drink than fresh water and suggests diluting the drinking water with as much sea water as taste can stand, in order to eke out supplies. Dr. Frisch, who devised a chemico-physical process for obtaining fresh water from sea water, points out that two British scientists, B. A. Adams and E. L. Holmes, previously devised another process, the patent for which was acquired by a German concern, which now uses it in the Baltic. Another correspondent suggests a still to be heated electrically, the power to be derived from a wind motor or in calm weather from manual power. But none of the many suggestions appear ever to have been put to a practical test.

The Treatment of Maxillofacial Wounds

The War Office has issued a memorandum on the preliminary treatment of maxillofacial wounds. Only first aid treatment is possible until the main dressing station is reached, which may be some hours after wounding. Early treatment is directed to saving life, the two main aims being to prevent suffocation and control hemorrhage. Loss of control of the tongue or displacement of bony tissue may obstruct the air passages. Attention should be paid to the possible presence of foreign bodies, such as fragments of teeth or dentures, which should be removed. Posture is of vital importance; the patient should be placed on the stretcher prone or semiprone to prevent the tongue from falling back. If sitting up or able to walk, he should do so with the head bent forward and downward. Correct posture will help to control hemorrhage by keeping the tongue forward. Ligation of visible bleeding vessels may be practicable at the

advanced dressing station. The ordinary four tailed bandage should never be used unless applied under the chin, as it is likely to increase the displacement of the fragments by backward pressure. In all cases the bandage should be applied under the chin so as to give gentle upward support. The main dressing or casualty clearing station is the first place where a dental officer will be available, and his cooperation should always be sought. After attention to shock, hemorrhage and respiration, roentgen examination should be made. In operative treatment the throat should be packed with one piece of 6 inch roll gauze during intratracheal anesthesia until the jaws are ready for intermaxillary wiring. As far as possible accurate apposition of fragments should be carried out. A tooth in the line of fracture should be extracted except when there is only one tooth on the distal fragment which might temporarily assist in control. Only the smallest bony fragments which are completely separated from periosteal attachments should be removed. In compound fracture of the mandible, suture of the lip should not be attempted until complete reposition of the fragments has been attained. At the first opportunity the patient should be evacuated to a maxillofacial hospital.

Planning for Mental Health

Three years ago the Council of the British Medical Association set up a committee to inquire into the medical equipment and provision for dealing with mental health, especially the prophylaxis and treatment of psychoneurotic and allied disorders. The work was virtually completed before the outbreak of war; only the consideration of the report remained. This has now been completed. The inquiry was chiefly directed to the psychoneuroses, but the psychotic cases could not be left out of consideration. The committee found it impossible to define exactly any criterion of mental illness and had to depend chiefly on "the manifestation of symptoms rather than on more scientific criteria in diagnosing the disorder." In 1938 in England and Wales 158,723 persons were notified as under care for mental disorder and 89,904 mentally defective persons. But the committee was more concerned with persons suffering from mental illness who had not been certified. In many parts of the country there was no one in private or hospital practice to care for such patients. Estimates as to the amount of psychoneuroses in the country varied widely. The committee concluded that in any group of sick persons something like 30 per cent suffer from conditions about which psychiatric advice, if not treatment, would be helpful.

Among the recommendations are education of mothers, nurses and teachers in the management of young children. This would materially lessen the incidence of psychoneuroses. So would training the growing child how to live and manage its instinctive urges. Advice should be sought in the early stage of mental illness. The better education of the general practitioner so that he may protect and guide his patients from their earliest years is an urgent requirement. There is need for specialized accommodation and treatment of acute mental illness with a prospect of recovery. Many more physicians should be trained in modern psychiatry. Every hospital with more than a hundred beds should have at least one medical psychologist.

Medical Officers for the Home Guard

The Home Guard is formed of men engaged in civilian work or retired who receive military training in their spare time. Many of them are past the military age, and some are old soldiers. The Home Guard was formed for the defense of the country in case of invasion and is now an efficient force for the purpose and to be found in every part of the country. Its organization has more and more approximated that of the regular army. The latest development is the medical service. Each battalion has now its own medical officer with the rank of major. His duty is to advise on the training of stretcher parties and on the medical organization of the battalion in con-

sultation with the civil defense authorities. At the headquarters of each Home Guard zone is a medical officer with the rank of lieutenant colonel, who coordinates the medical organization of the battalions in his area with the civil defense authorities. Each platoon has a first aid outfit, and its casualties are taken to the nearest first aid post of the civil defense organization and thence to the nearest casualty clearing station and, if sufficiently serious, to the nearest hospital under civil defense arrangements.

Control of the Distribution of Milk

With the continuance of the war, further restrictions must be expected. The latest is a priority scheme for the distribution of milk, which will be introduced during October. A child and an expectant mother are allowed 7 pints weekly, but other consumers only $3\frac{1}{2}$. Invalids will have special allowances, which remain to be determined. These regulations follow the fundamental principle of our food control—that people shall obtain the necessary foods according to their needs and not according to their purses.

BUENOS AIRES

(From a Special Correspondent)

July 5, 1941.

Control of Venereal Diseases

In Bolivia a division for venereal control has been created in the department of health by presidential decree. Every person affected with the disease in the infective stage must accept treatment. Patients prematurely discontinuing treatment must be reported by the physicians who treated them. An infected person cognizant of his condition and causing infection in others must defray the expenses of treatment of the infected person. The penalty for refusal to do so is set at two years' imprisonment. Alcoholic beverages may not be dispensed in brothels. Sources of infection must be reported by the physicians. Certificates are issued premaritally on request. Medicaments for the treatment of the disease may be secured only on medical prescription.

In La Paz a league against venereal dangers (*Liga contra el peligro venéreo*) has been organized within the ministry of health. Its purpose is to support the government in its fight on venereal diseases by means of publicity and health education.

In the management of syphilis, increased attention is being given to Chediak's microreaction. Prof. P. L. Balina, director of the clinic of cutaneous diseases of the university of Buenos Aires, and his associates compared the results obtained by this technic in 657 persons of both sexes and of different ages with the results obtained by the Wassermann and Kahn technics. In 131 cases of syphilis the Chediak test gave a positive reaction of 70.99 per cent and surpassed the Wassermann reaction by 12.91 per cent and the Kahn test by 8.40 per cent. In the remaining 526 nonsyphilitic cases the Chediak test was positive in 0.38 per cent. Here there was no difference between the three tests. Its simplicity, specificity and sensitization makes the Chediak test a valuable diagnostic aid for syphilis. It is also used for differential diagnosis in certain clinical forms of leprosy, in which other tests give only pseudopositive results.

According to Dr. Mario Renella, Córdoba, the Chediak test agreed with the Kahn test in 194 (96.51 per cent) of 217 cases and with the Wassermann test in 197 (91.24 per cent) cases. The Chediak test was thus 3.09 per cent more accurate than the Kahn test. In 25 cases of tuberculosis, typhoid, pneumonia and diphtheria the Chediak test was always negative. The Chediak test requires less material, time and personnel than other tests. Under certain conditions the test can be used for medicolegal purposes in cases in which the blood spots are less than twenty days old. Dr. A. Peralta Ramos, professor of gynecology in Buenos Aires, together with C. M. Parzizza tried

the test out in 6,745 cases and found Chediak's microreaction practical, specific and disclosing a 0.77 per cent greater sensitization than the standard Kahn technic.

M. A. Freire and S. Pieri of Córdoba, Argentina, used sulfanilamide vaginally in the treatment of gonorrhea in children. The drug was administered daily by instillation in a 25 to 50 per cent solution. Alkalinity was obtained by adding sodium bicarbonate. Excellent results were obtained in 10 of 20 girls under 10 years of age who completed the treatment.

Venereal lymphogranuloma is also receiving greater attention. Prof. Carlos Alberto Videla, professor of infectious diseases in Buenos Aires, and his associate E. S. Pedace succeeded in reproducing the disease experimentally. They determined the systemic diffusion of the virus in the human body by obtaining similar results in rabbits, guinea pigs and other animals with inoculations derived from various parts of the body. An issue of the *Revista Uruguaya de Dermatología y Sifilografía* is given to the discussion of this disease. It seems that this disease is spreading in Uruguay. Prof. José May, who first observed it in 1922, reported that he encounters 150 cases annually in Uruguay. In Colombia, venereal lymphogranuloma was unknown several years ago. It is now investigated because of its intensity and the variety of its manifestations. The spread of the disease is attributed to prostitutes.

Personal

Dr. E. Braun Menéndez, who was trained under Prof. B. A. Houssay, has been selected by the University of California to deliver the Morris Herzstein lectures in 1942. Menéndez's special field is that of renal hypertension.

A new method of practical instruction in physiology is to be tried out by Professor Houssay. Twenty third year students are to be specially trained to qualify them to assist in teaching other students. They are selected on the basis of examinations in foreign languages, algebra and general biology and must work in the institute five times a week.

Victims of the Nazi invasion of France include two Nobel prize winners, the radium investigators Joliot-Curie, husband and wife, who are seeking to transfer their scientific labors to Buenos Aires. The faculty of medicine of the University of Buenos Aires has invited them to conduct a series of lectures on radium.

Deaths

Dr. Luis M. Allende, professor of clinical surgery and orthopedics in the faculty of medicine of Córdoba, is dead.

Dr. Leopoldo Uriarte, whose name is associated with plague control in Paraguay (1899) and in northern Argentina (1919), died March 20.

Marriages

JOHN EMANUEL DOTTERER, State College, Pa., to Dr. ELIZABETH McCauley James of Sanford, N. C., August 19.

MARVIN HAYNE KENDRICK, Jacksonville, Fla., to Miss Barbara Barrett Truesdell of New York, September 6.

FRANCIS DUNCAN GIBSON JR., Gibson, N. C., to Miss Ruth Pearlle Gambrell of Greenville, S. C., recently.

GORDON KEITH ROGERS, Belzoni, Miss., to Miss Josephine McKelvey of Franklin, Tenn., in August.

ROBERT LICH JR., Louisville, Ky., to Miss Edna Haskell Troutman of Nelsonville, September 24.

GEORGE M. STROUD III, Cleveland, to Miss Doris Irene Kramer of Akron, Ohio, August 16.

WILLIAM ALLEN EXUM, Snow Hill, N. C., to Miss Norma Selden at Roaring Gap, August 27.

FRED B. HODGES JR., Austell, Ga., to Miss Shirley Rowe of Carrollton in Atlanta, August 21.

HENRY S. BROWNE to Mrs. Willie Myers Broach, both of Tulsa, Okla., August 16.

Deaths

Louis Faugeres Bishop Sr. ☉ New York; College of Physicians and Surgeons, medical department of Columbia College, New York, 1889; past president of the American Therapeutic Society; fellow of the American College of Physicians; member of the National Gastroenterological Association; secretary of the New York Academy of Medicine from 1895 to 1903; at one time professor of heart and circulatory diseases, Fordham University School of Medicine; formerly consulting physician to the Mercy Hospital, Hempstead; consultant on diseases of the heart, Lincoln Hospital; consulting cardiologist, Sea View Hospital, Staten Island, and the Goshen (N. Y.) Hospital; director of the New York School for the Deaf; trustee of Rutgers University, New Brunswick, N. J., and the Museum of the American Indian, New York; author of "Heart Disease, Blood Pressure and the Nauheim Treatment," "Arteriosclerosis," "Heart Troubles, Their Prevention and Relief," "A Key to the Electrocardiograms," and "History of Cardiology" and "Mechanism of the Heart and Its Anomalies," translated from the French; aged 77; died, October 6, of pneumonia.

Jarvis Gipson Dean, Dawson, Ga.; University of the City of New York Medical Department, New York, 1885; member and past president of the Medical Association of Georgia; past president of the Terrell County Medical Society; at one time member of the state board of health; formerly mayor; for many years member of the board of education; aged 83; died, September 11.

Joseph Wiener ☉ Asbury Park, N. J.; University of Maryland School of Medicine, and College of Physicians and Surgeons, Baltimore, 1925; fellow of the American College of Physicians; on the staffs of the Fitkin Memorial Hospital, Neptune, and the Monmouth Memorial Hospital, Long Branch; aged 39; died, September 8, of coronary thrombosis.

Robert Milligan Coleman, Lexington, Ky.; University of Virginia Department of Medicine, Charlottesville, 1901; formerly assistant demonstrator of anatomy at his alma mater; member of the Kentucky State Medical Association; served during the World War; aged 63; died, September 7, of bronchiogenic carcinoma of the right lung.

James Arthur Barnes ☉ Worcester, Mass.; Harvard Medical School, Boston, 1900; fellow of the American College of Surgeons; at one time chairman of the board of directors of the city public library; aged 69; on the staff of St. Vincent's Hospital, where he died, September 6, of cerebral hemorrhage and arteriosclerosis.

Millard Davis Hoskins, Chevrolet, Ky.; Hospital College of Medicine, Louisville, 1905; member of the Kentucky State Medical Association; at one time health officer of Bell County and mayor of Pineville; served during the World War; aged 57; died, September 4, at St. Joseph's Infirmary, Louisville, of acute pancreatitis.

John Patrick Henry Murphy, Washington, D. C.; Tufts College Medical School, Boston, 1910; member of the Medical Society of the District of Columbia; member of the New England Society of Psychiatry; aged 62; on the staff of St. Elizabeths Hospital, where he died, September 19, of bronchopneumonia.

Thomas Branch Alexander, Scituate, Mass.; Baltimore Medical College, 1901; member of the Massachusetts Medical Society; past president of the Norfolk South District Medical Society; acting assistant surgeon, United States Public Health Service; aged 65; died, August 28, of carcinoma of the prostate.

William Leonard Evans, Hanover, Ohio; Starling Medical College, Columbus, 1903; member of the Ohio State Medical Association; mayor; president of the county board of education; aged 61; died, September 10, in the City Hospital, Newark, of arteriosclerosis, hypertension and encephalitis.

Frederic Charles Hargrave ☉ Pasadena, Calif.; New York University Medical College, New York, 1896; an Affiliate Fellow of the American Medical Association; member of the Medical Society of the State of New York; aged 70; died, September 16, of carcinoma of the stomach.

Eilau Vance Boram, Muncie, Ind.; Medical College of Indiana, Indianapolis, 1898; member of the Indiana State Medical Association; on the staff of the Ball Memorial Hospital; aged 64; died, September 28, of hemorrhage from an intestinal ulcer, following gastroenterostomy.

Jeremiah Emmet Leahy, Chicago; Jefferson Medical College of Philadelphia, 1896; veteran of the Spanish-American War; clinical assistant in surgery at Northwestern University Medical School from 1910 to 1913; aged 70; died, September 13, of coronary thrombosis and arteriosclerosis.

Sol Stein Kaufman, Crowley, La.; University of Illinois College of Medicine, Chicago, 1931; member of the Louisiana State Medical Society; on the staff of the Legion Memorial Hospital; aged 34; died in September in the John Sealy Hospital, Galveston, Tex., of acute nephritis.

Alfred Theodore Eide ☉ Lake Placid, Fla.; Chicago College of Medicine and Surgery, 1908; served during the World War; formerly member of the state legislature; aged 56; died, September 7, in the Veterans Administration Facility, Bay Pines, of chronic endocarditis.

James Joseph Fitzgerald, Stanhope, N. J.; St. Louis University School of Medicine, 1912; formerly a member of the staff of the Illinois Department of Public Health and city physician of Granite City, Ill.; aged 53; died, September 16, of heart disease and pneumonia.

William Henry Gray, Mystic, Conn.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1889; member of the Connecticut State Medical Society; aged 79; died, July 17, of cerebral thrombosis and cerebral arteriosclerosis.

Ralph Joseph Karrasch, Chicago; Loyola University School of Medicine, Chicago, 1936; member of the Illinois State Medical Society; aged 32; died, July 30, at Martha Washington Hospital of bilateral apical pneumonia with streptococcal infection.

Peter Paul Baron ☉ Alameda, Calif.; College of Physicians and Surgeons, Los Angeles, 1918; served during the World War; formerly city health officer of Dorris and Alameda; aged 49; died, September 16, of gastrointestinal hemorrhages.

John Allison Schram, St. Joseph, Mich.; Indiana University School of Medicine, Indianapolis, 1931; member of the Michigan State Medical Society; aged 38; was found dead, September 9, of accidental asphyxiation with ethyl chloride.

Hans Schneider, Dousman, Wis.; Marquette University School of Medicine, Milwaukee, 1928; member of the State Medical Society of Wisconsin; aged 39; was found dead in his garage, September 18, of carbon monoxide poisoning.

Christian Gottlieb Hacker ☉ Albany, N. Y.; Albany Medical College, 1899; fellow of the American College of Surgeons; aged 64; died, September 20, in the Clifton Springs (N. Y.) Sanitarium of arteriosclerosis and heart disease.

Gideon Cross Segur, Hartford, Conn.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1882; member of the Connecticut State Medical Society; aged 90; died, August 31, of arteriosclerosis.

Eugene S. Hannum, Cleveland; Western Reserve University Medical Department, Cleveland, 1892; member of the Ohio State Medical Association; aged 82; died, September 1, of arteriosclerosis, hypertension and gastric hemorrhage.

Roger Ruben Wagoner, Columbus, Ga.; University of Georgia Medical Department, Augusta, 1931; served during the World War; aged 41; on the staff of the Bush Hospital, where he died, September 7, of coronary thrombosis.

Leo J. Rostow, Philadelphia; Medico-Chirurgical College of Philadelphia, 1905; aged 71; formerly on the staff of the Northern Liberties Hospital, where he died, September 3, of diabetes mellitus and empyema of the gallbladder.

James Albert Potter, Washington, D. C.; Howard University College of Medicine, Washington, 1906; member of the Medical Society of the District of Columbia; aged 64; died, August 27, in Minneapolis of coronary sclerosis.

R. A. Byers, Horse Branch, Ky.; Louisville Medical College, 1903; formerly member of the county board of education; state senator; aged 69; died, September 11, at St. Anthony's Hospital, Louisville, of cerebral hemorrhage.

Harry Brayton Townsend, Penn Yan, N. Y.; Bellevue Hospital Medical College, New York, 1898; member of the Medical Society of the State of New York; aged 70; died, September 18, of cardiac valvular disease.

James Caldan Denman, Franklinton, La.; Memphis (Tenn.) Hospital Medical College, 1905; member of the Louisiana State Medical Society; aged 66; was killed, September 13, near Leland, Miss., in an automobile accident.

Walter S. Wing ☉ Oconomowoc, Wis.; Northwestern University Medical School, Chicago, 1900; bank president; aged 67; died, September 20, in the Summit Hospital, of coronary sclerosis.

Joseph Francis Barry, Chaptico, Md.; University of Maryland School of Medicine, Baltimore, 1908; aged 64; died, September 17, in the Central Dispensary and Emergency Hospital, Washington, D. C., of urinary calculi.

Louis Edward Fuller, Danville, Va.; University of Louisville (Ky.) Medical Department, 1894; aged 69; died, September 1, in the Danville Community Hospital of cerebral hemorrhage and hypertension.

Glendie Bedford Young, Washington, D. C.; Columbian University Medical Department, Washington, 1888; veteran of the Spanish-American and World wars; aged 77; died, September 6, of heart disease.

George Irwin Garrison, Oklahoma City; Jefferson Medical College of Philadelphia, 1886; aged 90; died, September 13, in the Oklahoma City General Hospital of complications following fracture of the hip.

Joseph Aloysius Conaty Jr., Los Angeles; College of Physicians and Surgeons, Los Angeles, 1920; aged 48; on the staff of St. Vincent's Hospital, where he died, August 31, of carcinoma of the lung.

Holland M. Carter, Smoaks, S. C.; Medical College of the State of South Carolina, Charleston, 1903; member of the South Carolina Medical Association; aged 64; died, September 11, of pneumonia.

John A. Baker, Farmville, Va.; Leonard Medical School, Raleigh, N. C., 1909; aged 60; on the staff of the Southside Community Hospital, where he died, September 1, of carcinoma of the stomach.

Frederick Riley Wilson, Halfway, Ore.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; aged 65; died, August 31, of coronary occlusion.

Edward A. Baxter, Melbourne, Ark.; University of Louisville (Ky.) Medical Department, 1879; at one time county health officer and county coroner; aged 88; died, September 12, of carcinoma.

Evelyn Leon Adkins, Penasola, Kan.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1908; member of the Kansas Medical Society; aged 68; died, August 5.

Edward Foster Wolfe, Covington, Ky.; Louisville (Ky.) Medical College, 1898; member of the Kentucky State Medical Association; aged 69; died, September 6, of coronary thrombosis.

Glen Edrie Macklem, Miami, Fla.; University of Louisville (Ky.) Medical Department, 1908; aged 58; died, August 29, in Detroit, Mich., of coronary occlusion and arteriosclerosis.

Edwin T. Davis, Bound Brook, N. J.; Hahnemann Medical College of Philadelphia, 1882; aged 82; died in August in the Somerset Hospital, Somerville, of injuries received in a fall.

Jefferson Beri Mooney, Scooba, Miss.; Louisville (Ky.) Medical College, 1890; aged 73; died, August 10, in the Veterans Administration Facility, Gulfport, of cerebral hemorrhage.

Lawrence Charles Hess, Shanghai, China; University of Buffalo School of Medicine, 1936; was associated with the China Inland Mission; aged 30; died, August 29, of carbuncle.

Absalom J. Welch, McAlester, Okla.; Starling Medical College, Columbus, 1881; member of the Oklahoma State Medical Association; aged 84; died, September 15, of senility.

Isaiah Francis Carroll, Springdale, Conn.; Baltimore Medical College, 1906; aged 67; died, August 28, of gastric hemorrhage, cirrhosis of the liver and pernicious anemia.

Frank Grey Snyder ♂ York, Neb.; Barnes Medical College, St. Louis, 1897; on the staff of the Lutheran Hospital; aged 66; died, September 2, of coronary thrombosis.

Harry Urban North, Philadelphia; Jefferson Medical College of Philadelphia, 1903; aged 62; died, August 28, in the Presbyterian Hospital of gastric hemorrhage.

Barney Nosanchuk ♂ Detroit; Wayne University College of Medicine, Detroit, 1934; aged 33; was found dead, September 9, of an overdose of ether, self administered.

George Herbert Harkin, Rochester, N. Y.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1921; aged 46; died, July 28, of rheumatic endocarditis.

John Patrick Conroy, New York; Bellevue Hospital Medical College, New York, 1893; at one time district superintendent of schools; aged 80; died, September 13.

Dorothy Child ♂ Philadelphia; Johns Hopkins University School of Medicine, Baltimore, 1914; aged 53; was drowned, September 27, following an explosion on a yacht.

Allen J. M. Howard, Cleveland; Howard University College of Medicine, Washington, D. C., 1893; aged 77; died, September 1, of myocarditis and arteriosclerosis.

Edith Johnson Thomas, Uhrichsville, Ohio; College of Medicine and Surgery (Physio-Medical), Chicago, 1899; aged 82; died, September 2, of hypostatic pneumonia.

Louis Carswell Williams, Lambertville, N. J.; Jefferson Medical College of Philadelphia, 1901; aged 64; died, August 18, of cerebral hemorrhage and arteriosclerosis.

Nicholas Robert Galambos, Winnipeg, Man., Canada; Magyar Királyi Erzsébet Tudománygyetem Orvostudományi, Pecs, Hungary, 1924; aged 43; died, August 4.

Dennis Edward Ryan, Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1908; aged 59; died, September 6, of arteriosclerosis.

Provo L. Payne, Drexel, Mo.; Kentucky School of Medicine, Louisville, 1892; aged 76; died, August 19, in the Vineyard Park Hospital, Kansas City, of uremia.

Thomas Raymond Beggs, Cheboygan, Mich.; Vanderbilt University School of Medicine, Nashville, Tenn., 1912; aged 50; died, September 14, of lobar pneumonia.

Emma Whitson Moore, Kokomo, Ind.; Woman's Medical College of Pennsylvania, Philadelphia, 1891; aged 82; died, September 12, of carcinoma of the breast.

Carl Smith, Philadelphia; Temple University School of Medicine, Philadelphia, 1906; medical inspector for the city board of health; aged 68; died, July 30.

George A. Smith, Toronto, Ont., Canada; Western University Faculty of Medicine, London, 1913; served during the World War; aged 59; died, August 2.

George F. Lewis, Brazil, Ind.; Medical College of Indiana, Indianapolis, 1898; at one time county coroner; aged 81; died, September 7, at Winchester of senility.

Henry L. Stem, Union City, Pa.; Cleveland Medical College, 1892; member of the Medical Society of the State of Pennsylvania; aged 72; died, July 17.

James Matthew Cary, Marvyn, Ala.; Hospital College of Medicine, Louisville, Ky., 1906; aged 62; died, September 24, of cirrhosis of the liver and nephritis.

Rose Hammond Rice, Council Bluffs, Iowa; University of Nebraska College of Medicine, Omaha, 1903; aged 74; died, August 22, of coronary thrombosis.

David Alfred Angus, Rosalia, Wash.; Rush Medical College, Chicago, 1896; aged 73; died, August 2, of bronchopneumonia and chronic myocarditis.

Elmer Charles Wurst ♂ Defiance, Ohio; St. Louis University School of Medicine, 1932; aged 33; died, September 3, of subacute bacterial endocarditis.

Maurice J. Rubel ♂ Chicago; Johns Hopkins University School of Medicine, Baltimore, 1901; aged 66; died, September 17, of carcinoma of the liver.

Joseph Aloysius Turner, Philadelphia; Medico-Chirurgical College of Philadelphia, 1908; aged 57; died, July 19, of nephritis and arteriosclerosis.

Robert D. Lindley, Dallas, Texas; University of Louisville (Ky.) Medical Department, 1894; aged 67; died, August 30, of hypertensive myocarditis.

Walter Robert Taylor Sharpe, Romeo, Mich.; Detroit College of Medicine, 1895; served during the World War; aged 69; died, August 31.

John C. Berry ♂ Chicago; Chicago Medical College, 1890; aged 73; died, September 21, at the Englewood Hospital of mesenteric thrombosis.

Guido Milani, San Francisco; Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia, Italy, 1914; aged 53; died, August 29.

William Frederic Nutt, Chicago; Chicago Physio-Medical College, 1898; aged 87; died in September of hemorrhage of the urinary bladder.

Dick Frank Houston, McKinney, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; aged 74; died, September 3.

Bolivar B. McCutchan ♂ Clifton Forge, Va.; University College of Medicine, Richmond, 1895; aged 70; died, September 8.

Charles Getz ♂ Baltimore; University of Maryland School of Medicine, Baltimore, 1879; aged 85; died, September 6, of pneumonia.

Herbert Huntington Banks, Barrington Passage, N. S., Canada; Harvard Medical School, Boston, 1889; aged 75; died, August 5.

Bureau of Investigation

"ERUS-ERUC"—SURE CURE IN REVERSE

Vicious Tuberculosis "Treatment" Promoted by Hurlbert

The Bureau of Investigation of the American Medical Association received its first inquiry concerning "Erus-Eruc" and E. C. Hurlbert on Feb. 8, 1937. In August 1937 the California Board of Medical Examiners started its investigation of this product, which was promoted by Edward C. and Olive E. Hurlbert and their associates under the trade style "Erus-Eruc Tuberculosis Foundation."

The treatment apparently consisted of a mixture said to be based on kerosene and containing sassafras, to be used as a spray for the nose and throat three times daily, and also as a rubbing medicine. The cost to the credulous purchaser was \$35 a month; the claim was frequently made that most patients were cured in a period of four months. Evidence was developed which indicated that during 1939 and 1940 the Hurlberts collected in excess of \$30,000 from this activity.

The California board obtained death certificates of persons who had died while under the Hurlbert treatment, as well as records of numerous persons whose conditions had become much worse while taking the treatment. Prominent in their investigation were 2 patients 1 of whom was induced to leave a

without a license) and Section 4030 (practicing pharmacy without a license) of the Business and Professions Code, and petty theft. The arraignment was on Feb. 27, 1939. The defendants entered a plea of not guilty and asked for a jury trial, which was set for March 24. On that date the deputy city attorney entered a motion of dismissal for the purpose of filing an amended complaint. This was granted and the amended complaint filed containing the same charges except that petty theft was revised to attempted petty theft. Trial was set for April 25.

On April 20 the defendants requested permission to plead guilty to Section 2141, on consideration that the other count of the complaint be dismissed. They also begged for continuance while entering the plea, and this was granted until May 4, with the stipulation that if, at that time, they did not enter a plea of guilty the judge would find them in contempt of court.

The hearing was finally set for June 1, after the defendants had pleaded guilty as designated. Every effort was made to present evidence on which a denial of probation could be obtained. Such evidence included thirteen death certificates of defendants' victims, some twenty-odd contracts ranging from \$100 to \$150 which had been obtained from the victims, reports of chemical analyses showing the product to be falsely and fraudulently claimed a cure for tuberculosis or any other human ailment and voluminous evidence of bad faith of the defendants for a period of at least two years prior to the action then before the court.

The court sentenced the defendants to one hundred and eighty days in jail, which was suspended for the period of probation, granted for two years. The terms of the probation were that the defendants should not diagnose the disease of any patient, prescribe their treatment or any other remedy, personally administer their treatment, have any direct personal contact with any patient or have any agreement for splitting fees with any physician and should refrain from advertising their treatment as a sure cure for tuberculosis.

The California board, however, continued its investigation, and approximately six months later evidence was obtained of the violation of the probation on the part of Edward C. Hurlbert. This evidence was sufficient to cause the judge to issue a bench warrant for Hurlbert's arrest. On Jan. 15, 1940, a hearing was held and the Court stated that, in his opinion, the People had established a prima facie case. The defendant was then allowed to take the stand and attempted to testify in his own behalf. At the conclusion, the Court made, in substance, the following statement, according to the report from the California board:

"At the point at which this Court decided that the People had established a prima facie case of violation of probation on the part of the defendant, it was anticipated that a commitment for the previously specified period of one hundred and eighty days in the city jail would be ordered. While listening to defendant's testimony the Court has decided upon an alternative in the form of modification of the original terms of probation which will be offered to you with the understanding that you may accept it as an alternative to the six months' commitment." (At this point the Court observed Mrs. Olive E. Hurlbert in the court room, and called her forward to join her husband before the Bench.)

"It is the order of this Court that Edward C. Hurlbert and Olive E. Hurlbert, each, for the remainder of the period of probation, refrain from any connection with Erus-Eruc, or any other treatment for tuberculosis, or any treatment of any kind, shape or form, of any human ailment. It is to be understood that this order includes not only those terms previously set forth in the probation order, or the language of the complaint originally filed in this action, but also that the defendants shall be precluded from manufacture or sale or distribution or agency or any other association in any manner of form with anything which could be considered a treatment of the sick and afflicted. It is further to be understood that this order apply not only to all members of their family, but also to all persons with whom they may be associated, either directly or in any representative capacity.

"Mr. and Mrs. Hurlbert thereupon, in open court and with the advice of counsel, accepted the alternative as proposed by the Judge.

"The final terms of probation as provided in Judge Landreth's order of modification of probation are as follows:

"In the case of People versus Edward C. Hurlbert and Olive Hurlbert, the terms of probation are modified in substance as follows: That the Edward C. Hurlbert and Olive Hurlbert together and separately cease the manufacture, sale and distribution or advertising of the product known as Erus Eruc or any other remedy purporting to cure or relieve tuberculosis or any disease of any kind; that this modification shall apply to these defendants acting directly or indirectly as individuals, as partners, as agents, as directors or stockholders of any corporation or in any capacity whatsoever or through any members of their family; it being the intention of this order of modification that the defendants separate themselves entirely from any connection with Erus Eruc or any other remedy purporting to cure any disease or ailment or disfigurement or injury and the period of probation extended to June 1941."

ROSS C. MARTIN, M. D.
NATIONAL MEDICAL DIRECTOR
SAN BERNARDINO, CALIF.
DR. ARTHUR J. PRIESTER
FIELD MEDICAL DIRECTOR
BAKERSFIELD, CALIFORNIA

E. C. HURLBERT, MANAGER
OLIVE E. HURLBERT
ASSISTANT MANAGER
OLIVER M. HICKEY
ATTORNEY AND SECRETARY
DALE E. HURLBERT, TREASURER

ERUS-ERUC TUBERCULAR FOUNDATION
418 PERSHING SQUARE BUILDING
LOS ANGELES, CALIFORNIA

MAIN OFFICE:
VANDIKE 6754

GLENDALE OFFICES:
DOUGLAS 8519
KENWOOD 0743

The "Foundation's" card

tuberculosis sanatorium and institute this treatment. He was subsequently readmitted to the sanatorium in a dying condition. The other patient's father and mother who were on relief were using money given them for food in order that their son's treatment with Erus-Eruc might not be discontinued. The son is now dead.

On the card herewith reproduced no claim is made to the possession of any degree whatever by either Hurlbert or his wife. Connected with the organization was one Ross C. Martin, M.D.

It has been intimated that, because of the procedures in California, these people or their agents have moved production of this fake remedy to the state of Arizona. It is understood that the Food and Drug Administration is now interested in the case by virtue of the fact that it would appear that shipments of the drug are being made into San Bernardino County, where one C. E. Grier, who has been active throughout the investigation of the case in California, is chairman of the Board of Supervisors.

As much as the California board regrets this latest activity, there is nothing further that it can do except merely to call attention to the fact that any action taken against this procedure is in the hands of the district attorney. Both the Board of Medical Examiners and the Board of Pharmacy have done all that they are legally empowered to do to squelch this vicious promotion in the state of California.

There follows herewith a brief history of the proceedings of the investigation, abstracted from reports submitted to the American Medical Association:

The case was filed in the Municipal Court of Los Angeles in the form of a joint complaint entitled "The People vs. Edward C. Hurlbert and Olive E. Hurlbert." The complaint contained three charges: violations of Section 2141 (practicing medicine

Of special interest to the medical profession are the two items which follow, these were received from the California State Board of Medical Examiners

"1 Perley B Exelby, M.D., charged with aiding and abetting Edward C Hurlbert and Olive E Hurlbert in the practice of medicine. Complaint for revocation of license filed May 29, 1939. October 17, 1939, found guilty. October 18, 1939, license revoked. October 21, 1940, revocation set aside. Respondent placed on probation five years.

"2 William R Owens, M.D., charged with aiding and abetting Edward C Hurlbert and Olive E Hurlbert. Complaint for revocation of license filed May 29, 1939. October 17, 1939, Board's case presented. Matter continued. February 28, 1940, guilty, and placed on probation five years. June 7, 1940, died."

There does not seem to be any information available concerning the present activities of the Hurlberts. There have been some intimations that the promotion of Erus-Eruc continues somewhere beyond the borders of the state of California. Presumably, if this drug is now being shipped interstate, as intimated, the Food and Drug Administration will continue to be interested in it.

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," cosmetics or medical devices have agreed with the Federal Trade Commission to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Acquin—This product has been represented as competent in treating headaches, simple neuralgia, colds and sore throat. In March 1940 the Federal Trade Commission prevailed on the Acquin Pharmaceutical Company, St. Louis, also trading as Acquin Products Company, to discontinue such representations and to cease offering the product as being efficacious for any purpose other than as a temporary relief of minor pains or the mild discomforts incident to them. Back in September 1936 the Acquin concern had promised the Commission that it would cease representing that Acquin would prevent pneumonia, influenza, catarrh, mastoiditis, meningitis, tuberculosis, or other 'dread diseases', that it was a remedy for all sorts of aches and pains, colds and sore throats, that it would soothe the nerves or act as an antiseptic was 'safe' and contained a 'miracle ingredient'. The company further agreed not to publish any statements which by use of the first person or other terminology would create the impression that such statements portrayed the experience of any individual, unless this was a fact.

Beutalure Hair Tonic or Beutalure Hair Lotion—This product, variously designated by the two names given, is put out by Beutalure, Inc., Wilmington, Del., which advertised that it would bring hair back to its original shade, that it contained no dye, would relieve dandruff, check excessive falling hair, reveal the natural hidden beauty of the hair or prove to be a competent treatment for dull, gray or streaked hair. In August 1940 the Federal Trade Commission prevailed on the concern to discontinue these misrepresentations (except that it might advertise the product for dandruff by making the claim that it was only for the temporary removal of the condition). The company also agreed to cease describing its product as a tonic and to eliminate the word 'tonic' from the trade name of its product.

Cleo-Pax—This is a so called wrinkle plaster put out by Jay P. Walk, Chicago trading under the firm name Cleo Pax. In May 1940 Walk stipulated with the Federal Trade Commission that he would cease using any statement directly asserting or implying that the use of the products will check or prevent the formation of wrinkles, lift up sagging facial lines or cause lines or wrinkles which result from age to fade away or become shallower. He also agreed to desist from advertising that use of these products will rejuvenate aged or aging skin or eradicate facial lines or wrinkles.

Dated Cream—In May 1940 Theresa H. Boyer and Ann Bray, Evansville, Ind., trading as Dated Cream Company, promised the Federal Trade Commission to cease representing that their cream has healing properties or penetrates the skin, that it will go down deep into the pores and cleanse them of all foreign matter or will stimulate the pores to normal action, or activate the sebaceous glands or do more than cleanse the surface. They also agreed to discontinue the misrepresentations that their product will vitalize the skin or remove wrinkles, prevent or restore sagging muscles or restore a substance natural to the skin.

La Palm Rapid Hair Grow—This is put out by one Maurice J. Allen, trading as M. J. Allen Co., Des Moines, Iowa, who in July 1940 signed a stipulation with the Federal Trade Commission that he would cease representing by means of the trade name 'La Palm Rapid Hair Grow' or in any other manner that his product will grow hair or cause hair to grow more rapidly, will aid in the more rapid growth of hair or will give new life to the hair.

LaRue's Master Scalp Treatment—This is put out by a William S. LaRue trading as LaRue Laboratories, Omaha. In July 1940 LaRue stipulated with the Federal Trade Commission that in the advertising of his 'treatment' he would discontinue certain misrepresentations. Among these were that dandruff is caused by germs, that bad nerves are the paramount cause of all gray hair, that use of the product will retard either gray or falling hair or will stimulate hair growth or help bring back its natural oil and give it brilliant luster.

Purcell Products—These consist of drugs and cosmetics. In April 1940 Purcell and Company, Inc., Chicago, signed a stipulation with the Federal Trade Commission promising to discontinue the use of the term 'Vitamin T' to designate one of its products when in fact no so called Vitamin 'F' is included among the vitamins currently recognized by authorities on vitamin nomenclature.

Neural Aid and Myacin—In the sale of "Neural Aid" Biovegetin Products, Inc., of Chicago, also trading as V. M. Products, signed a stipulation with the Federal Trade Commission in March 1940 agreeing to discontinue certain advertising misrepresentations. Among these were that Neural Aid is a nerve food or a competent treatment or effective remedy for nervousness, neuralgia, nerve fatigue, constipation, nervous insomnia, constant worry, muscular aches or pains or disturbances of the nervous system or for neuritis unless the last named representation is limited to the preparation's aid in the treatment of peripheral neuritis, alcoholic neuritis, neuritis due to anemia or neuritis of either pregnancy or pellagra. In a second stipulation, signed around the same date, Biovegetin Products Inc. promised to stop advertising that another of its products, "Myacin" kills or ends pain, or otherwise implying that it will afford more than temporary relief from pain associated with rheumatism, arthritis, neuritis, sciatica, gout or lumbago, that it contains no harmful or habit forming drugs, affords safe relief, and that its formula originated in Europe or is used by thousands of American doctors and hospitals. The stipulation revealed that the company's preparation contains an ingredient which has a tendency to be harmful and habit forming.

Reliance Double Quinine Hair Grower and Reliance Hair Dressing Pomade—These are put out by George W. Lundgren, one of the copartners trading as Reliance Drug Company and Relco Drug Company, Inc., New York, present owner of Reliance Drug Company. In July 1940 these interests promised to cease representing that the products mentioned will, when applied externally, cause or promote the growth of hair, will stop falling hair, or will remove dandruff in the sense that it will not reappear.

Richfal Abdominal Support—In July 1940 the United States Trust Company, Cincinnati, which puts out this "Support," promised the Federal Trade Commission that it would cease using any statement or representation which directly asserts or implies that the use of its device will have the effect of causing one to 'reduce without exercise,' will enable the user to 'keep thin without dieting' or will otherwise result in the loss of excess fat.

Riteway Corn and Callous Remover—This is put out by an Edna Foster, St. Paul, trading as American Royal Products Company. In May 1940 this person stipulated with the Federal Trade Commission to cease representing that her product is 'amazing, new, marvelous sensation or different,' or is superior to other products. Around the same time Van de Mark Advertising, Inc., Cincinnati and Claude Efnor, its vice president, promised the Federal Trade Commission to discontinue similar representations.

Roll Away Lotion—In a stipulation signed in January 1940 Arthur M. Donnelly and E. R. Evans trading as the Donnelly Company, St. Louis, promised the Federal Trade Commission that they would discontinue certain misrepresentations in the advertising of this product. Among these were that this or any other cosmetic preparation containing substantially the same ingredients or the same properties whether sold under the name 'Roll Away Lotion' or any other designation is the only new and unique skin lotion on the market, the only preparation which rolls off the skin and the only cleanser which will not dry the skin. They promised also to cease representing that their product is efficient as a general healing preparation, that it smooths out horny, scratchy or wrinkled skin in every instance, possesses penetrating qualities, is more effective than other lotions in softening and smoothing rough, cutaneous surfaces, whitens the skin or possesses bleaching properties.

Sylphide (or Cleo) Tea—This is put out by a Los Angeles concern, the Medical Tea Company of California. In August 1940 this company promised the Federal Trade Commission to cease representing that the product consists of various herbs, is safe to use for weight reducing purposes except when such use is moderate or employed over short periods of time, or that it is a competent and effective remedy or treatment for obesity, except to the extent that it may reduce weight by increased elimination. The concern also stipulated that it would cease representing that some of the ingredients of 'Sylphide Tea' possess certain therapeutic properties which they do not in fact possess.

Wyd-E-Wake Silicon Tea and Vitamin B Food Cons—These are put out by a Janet Warfel trading as Nutritional Service, Chicago, who in July 1940 entered into a stipulation with the Federal Trade Commission, promising to discontinue certain advertising misrepresentations. Among these were that the tea is a health beverage an excellent source of calcium, silicon and manganese, that it is an antiseptic or an invigorating agent of the generative system that it performs many important functions in the body, has any influence on the body's resistance to disease, or possesses qualities conducive to mental peace, contentment or contemplative pleasure. She also promised to cease representing that the human body is deficient in silicon, that mental lethargy or dullness is symptomatic of silicon scarcity, that silicon is helpful in all cases in which eyes, hair or nails are in poor condition or that pimples or blemishes are cleared up when silicon levels have been restored to the body.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 16-17, 1942. Council on Medical Education and Hospitals, Sec., Dr. William D. Cutter, 535 North Dearborn Street, Chicago.

MEDICAL CORPS, UNITED STATES NAVY

Examination. Assistant Surgeon with the permanent rank of Lieutenant (junior grade) and Acting Assistant Surgeon with the probationary rank of Lieutenant (junior grade), Jan. 5-9. Examination will be held at the Naval Hospitals at Chelsea, Mass., Newport, R. I., Brooklyn, Philadelphia, Norfolk, Va., Charleston, S. C., Pensacola, Fla., Corpus Christi, Tex., San Diego and Mare Island, Calif., Puget Sound, Wash., Great Lakes, Ill., Pearl Harbor, T. H., and Naval Medical Center, Washington, D. C. Apply Rear Admiral Ross T. McIntire, M.D., Surgeon General, U. S. Navy, Washington, D. C.

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, October 18, page 1379.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 16-18. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARKANSAS: * Medical. Little Rock, Nov. 6-7. Sec., Dr. D. L. Owens, Harrison. *Eclectic*. Little Rock, Nov. 6. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, Dec. 10. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

CONNECTICUT: * *Medical Examination*. Hartford, Nov. 11-12. *Endorsement*. Hartford, Nov. 25. Sec., Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic*. Derby, Nov. 11-12. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 14-16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * Washington, Nov. 10-11. Sec., Dr. George C. Ruhland, 6150 East Municipal Bldg., Washington.

FLORIDA: * Jacksonville, Nov. 24-25. Sec., Dr. William M. Rowlett, Box 786, Tampa.

HAWAII: Honolulu, Jan. 12-15. Sec., Dr. James A. Morgan, 48 Young Bldg., Honolulu.

INDIANA: Indianapolis, June 16-18. Sec., Board of Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Topeka, Dec. 9-10. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

KENTUCKY: Louisville, Dec. 8-10. Sec., Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Portland, Nov. 12-13. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 129 State St., Portland.

MARYLAND: *Medical Examination*. Baltimore, Dec. 9-10. Sec., Dr. John A. Evans, 1215 Cathedral St., Baltimore.

MASSACHUSETTS: Boston, Nov. 4-7. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MISSISSIPPI: *Reciprocity*. Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: Kansas City, Oct. 29-31. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

NEW HAMPSHIRE: Concord, March 12-13. Sec., Dr. T. P. Burroughs, Board of Registration in Medicine, State House, Concord.

NORTH CAROLINA: *Endorsement*. December. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 6-9. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OKLAHOMA: * *Reciprocity*. Oklahoma City, Dec. 10. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: Portland, January. Exec. Sec., Miss Lorianne M. Conlee, 608 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia, January. Acting Sec., Bureau of Professional Licensing, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, Nov. 10-11. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: * Pierre, Jan. 13-14. Dir., Medical Licensure, Dr. J. F. D. Cook, State Board of Health, Pierre.

TEXAS: Austin, Nov. 17-19. Sec., Dr. T. J. Crowe, 918 Texas Bank Bldg., Dallas.

VERMONT: Burlington, Feb. 10-12. Sec., Board of Medical Registration, Dr. F. J. Lawliss, Richmond.

VIRGINIA: Richmond, Dec. 9-12. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WEST VIRGINIA: Charleston, Nov. 17-19. Sec., Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

WISCONSIN: * Madison, Jan. 13-15. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, Dec. 16. Sec., Mr. Franklin E. Roach, Science Hall, University of Arizona, Tucson.

COLORADO: Denver, Dec. 10-11. Sec., Dr. Esther B. Starks, 1459 Oden St., Denver.

MICHIGAN: February. Sec., Miss Flora E. Dube, East Lansing.

RHODE ISLAND: Providence, Nov. 19. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Aberdeen, Dec. 5-6. Dr. G. M. Evans, Yankton.

WISCONSIN: Milwaukee, Dec. 6. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

Maryland June Report

The Board of Medical Examiners of Maryland reports the written examination for medical licensure held at Baltimore, June 17-20, 1941. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. One hundred and forty-four candidates were examined, 138 of whom passed and 6 failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
Yale University School of Medicine.....	(1939)		1
George Washington University School of Medicine.....	(1939, 2), (1940, 3)		5
Georgetown University School of Medicine.....			3
Howard University College of Medicine.....			4
Northwestern University Medical School.....			1
Rush Medical College.....	(1940)		1
University of Chicago, The School of Medicine.....	(1939)		1
Johns Hopkins University School of Medicine.....	(1940, 3), (1941, 34)		37
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1937), (1940, 3), (1941, 57)		61
Harvard Medical School.....	(1937), (1938)		2
University of Rochester School of Medicine.....	(1940), (1941)		2
Duke University School of Medicine.....	(1938)*		1
Jefferson Medical College of Philadelphia.....	(1939), (1940), (1941)		3
Temple University School of Medicine.....	(1941)		1
University of Pennsylvania School of Medicine.....	(1939), (1940), (1941, 2)		4
University of Toronto Faculty of Medicine.....	(1925), (1935)*		2
McGill University Faculty of Medicine.....	(1940)		1
Medizinische Fakultät der Universität Wien.....	(1922), (1924)		2
University of London Faculty of Medicine.....	(1936)*		1
Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pecs.....	(1925)		1
Universiteit van Amsterdam Geneeskunde Faculteit.....	(1911)		1
Unwersytet Jagielloński Wydział Lekarski, Cracow.....	(1937)		1
Universität Basel Medizinische Fakultät.....	(1939)		1
Universität Zürich Medizinische Fakultät.....	(1937)		1

School	FAILED	Year Grad.
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1940)	
Albert-Ludwigs-Universität Mediz. Friedrich-Wilhelms-Universität Med. Johann Wolfgang Goethe-Universität.....	(1903), (1913)	
Regia Università degli Studi di Messina. Facoltà di Medicina e Chirurgia.....	(1921)	
Second Leningrad Medical Institute.....	(1926)	

Fourteen physicians were licensed to practice medicine by reciprocity and 8 physicians so licensed by endorsement from January 16 through July 31. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists.....	(1931) Colorado,	(1931)	California
Stanford University.....	(1938)	(1938)	California
University of Calif.....	(1935)	(1935)	California
Yale University School of Medicine.....	(1932)	(1932)	Illinois
George Washington University School of Medicine.....	(1921) Dist. Colum., (1933) Ohio, (1936) Pennsylvania	(1921)	Georgia
University of Georgia School of Medicine.....	(1935)	(1935)	Kentucky
University of Louisville School of Medicine.....	(1939)	(1939)	Tennessee
Meharry Medical College.....	(1933), (1939)	(1933)	Virginia
Medical College of Virginia.....	(1936)	(1936)	Virginia
University of Virginia Department of Medicine.....	(1938)	(1938)	Virginia

School	LICENSED BY ENDORSEMENT	Year Endorsement of
College of Medical Evangelists.....	(1940), (1941) N. B. M. Ex.	(1940)
Yale University School of Medicine.....	(1933) N. B. M. Ex.	(1933)
Columbian University Medical Department.....	(1898) U. S. Army	(1898)
New York University College of Medicine.....	(1936) N. B. M. Ex.	(1936)
Duke University School of Medicine.....	(1938) N. B. M. Ex.	(1938)
University of Pennsylvania School of Medicine.....	(1933) N. B. M. Ex.	(1933)

* License has not been issued.

Connecticut Homeopathic July Report

The Connecticut Homeopathic Medical Examining Board reports the written examination for medical licensure held at Derby, July 8-9, 1941. The examination covered 7 subjects and included 70 questions. An average of 75 per cent was required to pass. Three candidates were examined, all of whom passed. One physician was licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
Hahnemann Medical College and Hospital of Philadelphia.....	(1939, 2), (1940)*		3

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Hahnemann Med. College and Hospital of Philadelphia.....	(1934) New Jersey		

* Licenses have not been issued.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Oklahoma Law Authorizing the Compulsory Sexual Sterilization of Habitual Criminals Constitutional.—The Oklahoma Habitual Criminal Sterilization Act (57 Okla. St. Ann. Sections 171-195) authorizes the attorney general to institute proceedings for the sexual sterilization of any person adjudged to be a habitual criminal, defined, in effect, to mean a person who has been convicted three or more times to final judgment of the commission of crimes amounting to felonies involving moral turpitude and on the basis of the last conviction sentenced to imprisonment in an Oklahoma penal institution. Questions of fact involved in such a proceeding may, on the demand of either party, be tried by jury, and, if the court or jury, as the case may be, finds the defendant to be a habitual criminal and that he or she may be rendered sterile without detriment to his or her general health, the court may, subject to an appeal to the Supreme Court of Oklahoma, order sterilization. Such a proceeding was instituted against the defendant Skinner, who was confined in a state penitentiary and admittedly had been convicted three times of the commission of crimes of the type mentioned in the act. The last conviction, however, was had in 1934, a year before the enactment of the act. A jury found that the defendant was a habitual criminal within the meaning of the act and that his general health would not be impaired by a sterilization operation. Accordingly the trial court ordered the defendant to be made sexually sterile, and the defendant appealed to the Supreme Court of Oklahoma.

Skinner contended that the act under the purported authority of which his sterilization was ordered violated rights guaranteed to him under both the state and the federal constitution in that the act (1) inflicts a cruel and inhuman punishment, (2) constitutes a bill of attainder and (3) is an ex post facto law. The constitutional inhibitions invoked by the defendant, said the Supreme Court, have reference only to the punishment of crime and have no bearing if the act is not a penal law and if sterilization is inflicted not as a punishment but as a eugenic measure. If the act is regarded as a penal act, the act, regardless of the question as to whether or not sterilization constitutes a cruel and unusual punishment, would clearly be unconstitutional as applied to this defendant as an ex post facto law in that the act had been passed subsequent to Skinner's last conviction. The court believed, however, that the act was not purely a penal statute and that the sterilization it provided for was imposed as a eugenic measure, and not as a punishment, to improve the safety and general welfare of the race by preventing from being born persons who would probably become criminals. As the basis for its views the court pointed out that the procedure called for under the act to effect the end of sterilization was the procedure as in civil cases and that the operation called for was not to be ordered as a part of any judgment of conviction or sentence but, in fact, could be imposed on a habitual criminal who had served his sentence and had been released. Skinner argued that the failure of the act to require a hearing on the question as to whether or not a particular defendant would likely beget criminal children indicated that the legislature had no eugenic purpose in mind. But, answered the court, that fact does not negative a eugenic purpose on the part of the legislature; it simply indicates that the legislature was satisfied that criminal tendencies in all such persons are inheritable. Nor do the facts that the act applies to persons of any age and to persons sentenced to life imprisonment and does not provide for the operation at the time a habitual criminal is about to be released from custody show the legislative intent to be penal rather than eugenic. It is just as reasonable to presume that in passing a eugenic law

the legislature was mindful that prisoners may escape or be pardoned without affording an opportunity for the operation to be performed and did not think it wise to place an age limit on the persons subject to sterilization.

The defendant next contended that the failure of the act to require as a condition precedent to compulsory sterilization a finding by the court or jury that by the laws of heredity the defendant is the probable potential parent of children with criminal tendencies deprives the defendant of a full hearing in violation of the due process clauses of both the state and the federal constitution. Due process, said the Supreme Court, has a dual significance, as it pertains to procedure and substantive law. As to procedure, it means notice and an opportunity to be heard and to defend in an orderly proceeding before a competent and impartial tribunal. In substantive law, due process may be characterized as a standard of reasonableness, and as such it is a limitation on the exercise of the police power. The objection of the defendant in this connection really goes to the question of due process in relation to substantive law rather than procedure. The question is whether the legislation under consideration is a reasonable exercise of the police power in providing that all habitual criminals shall be sterilized, for, if it is proper to enact such a provision, the procedural aspects are satisfied; that is, notice and a hearing on the issues of whether the particular defendant is such a habitual criminal and whether the operation is detrimental to his health. If such a provision is not proper, then the objection is that it is an unreasonable exercise of the police power and not that the procedure is inadequate. The determination of the reasonableness of the provisions of the act as an exercise of the police power is based on the question of fact as to whether habitual criminals possess an inheritable tendency to crime which will be passed on to their children if they are allowed to procreate. If that is true, then the act bears a real relation to public welfare. If it is not true, the act encroaches on the constitutional rights of individuals without justification. In every case in which a court is called on to decide whether a particular statute is a proper exercise of the police power as against an improper infringement on constitutional rights, the court must, before it can strike down the act, decide that the existing facts do not justify the conclusion of the legislature that the law enacted by it bears a real relation to health, safety or public welfare. It must be assumed that the legislature had before it statistics, scientific works and information from which it found as a fact that habitual criminals are more likely than not to beget children of like criminal tendencies who will probably become a burden on society. Legislative determination must be given great weight by the courts. Every presumption must be indulged in favor of the existence of facts assumed and acted on by the legislature, and courts are not at liberty to strike down the act unless they can see beyond a reasonable doubt that the legislature was clearly in error, was wholly unwarranted and acted arbitrarily in assuming or determining such facts. We all know, said the court, that heredity plays some part in our mental, moral and physical makeup; just what part no one knows exactly. We know that insanity and idiocy are hereditary, and this court has previously sustained a law providing compulsory sterilization for persons so afflicted. Some authorities believe that habitual criminals have an inheritable trait of insanity. In passing the act under consideration, the legislature probably assumed this to be a fact. If such is a fact, the welfare of society dictates that the state shall, in the exercise of its police power, prevent such persons from reproducing their kind. We think no one would doubt that this court should sustain the present law if it required a third finding to the effect that the accused is the potential parent of offspring with inherent criminal tendencies but in the very nature of the case, testimony by expert witnesses on this question would be highly speculative and a finding by a court or jury, based on such testimony, would likewise be speculative. The opinion of the experts would probably be based in part at least on data that

were available and considered by the legislature at the time of enacting the law. If a court or jury can make a finding of fact based on such speculative evidence, we can see no reason why the legislature cannot find or assume facts, based on the same speculative evidence, as a basis for the exercise of the police power. We find nothing in the record that justifies a finding by this court that the legislature was clearly and beyond a reasonable doubt in error in assuming facts justifying the act as a proper exercise of police power. Without such a showing, or unless the legislative determination is plainly contrary to those matters of common knowledge of which the court may properly take judicial notice, we should not declare the act unconstitutional. Our knowledge on the subject, which is not a knowledge of law but of science and observation, is not superior to that of members of the legislature, and we should be extremely careful not to trench on legislative discretion and power. The right to veto or repeal laws is not vested in the courts, and they are not concerned with the wisdom of the law.

Finally, the defendant contended that the act denied him equal protection of the law, in violation of state and federal constitutional provisions. The test, said the Supreme Court, of equal protection of the law is dependent on the reasonableness of the classification. The act here applies to all habitual criminals whether incarcerated in an institution or not. To the court it appeared that the classification was reasonable and that therefore there was no arbitrary or unlawful discrimination. Accordingly the judgment of the lower court ordering the compulsory sterilization of the defendant was affirmed, with four justices dissenting.—*Skinner v. State ex rel. Williamson*, 115 P. (2d) 123 (Okla., 1941).

Chiropractic: Death of Diabetic Patient Following Withdrawal of Insulin.—Following the death of one of his patients, an information was filed against the defendant chiropractor charging him with manslaughter. The criminal court of record, Dade County, granted a motion, submitted by the defendant, to quash the information, and the state appealed to the Supreme Court of Florida.

The information alleged that the patient was suffering from diabetes for which he was taking insulin at the time the defendant commenced to treat him for an injured foot. The defendant, it was alleged, was aware of the patient's diabetic condition yet advised and instructed the patient to discontinue the use of insulin, with the result that the patient died. It was further charged that insulin was an indispensable remedy in the treatment of diabetes and that the patient's death was due to the unskillful acts and procurement, culpable negligence and gross ignorance of the defendant.

In the opinion of the Supreme Court, the information was sufficient against the defendant's attack on it. In so holding, the court referred to a Washington case, *State v. Karsunky*, 197 Wash. 87, 84 P. (2d) 390 (J. A. M. A. 113:1357 [Sept. 30] 1939), in which a drugless practitioner advised against the use of insulin by a diabetic patient and prescribed a new and different diet. The patient died and a prosecution for manslaughter followed. The Supreme Court of Washington, in support of its conclusion that the defendant was proved guilty, observed that the defendant, when he undertook to administer treatment, "was bound to know the nature of the remedies he prescribed and also the treatment—this includes advice respecting use or nonuse of anything—he adopted (discontinuance of use of insulin and unrestricted intake of carbohydrates), and he is responsible criminally for the death resulting to the patient from gross ignorance in the application of the treatment." The Supreme Court of Florida in the present case felt that if a person undertakes to cure those who search for health and who are, because of their plight, more or less susceptible of following the advice of any one who claims the knowledge and means to heal, he cannot escape the consequence of his gross ignorance of accepted and established remedies for the treatment of diseases from which he knows his patients suffer, and if the wrongful acts of such a practitioner, positive or negative, reach the degree of

grossness, he must answer to the state. The information in this case, in the opinion of the court, clearly charged that the defendant was in such a position and that the death of the patient was directly traceable to his gross ignorance. The order granting the defendant's motion to quash was therefore reversed.—*State v. Heines*, 197 So. 787 (Fla., 1940).

Naturopathy: Right of Practitioner to Use Facilities of State Board of Health.—In 1939 the Florida State Board of Health promulgated a rule which denied to naturopaths the use of its specimen containers, biological products and laboratory services but made available such services to doctors of medicine, osteopaths and dental surgeons only. The plaintiff, a naturopath, filed a petition for a writ of mandamus in the Supreme Court of Florida to compel the board to rescind the rule.

The plaintiff admitted that the defendants had a right to promulgate proper rules but contended that the one in question worked a discrimination against naturopaths. The defendants argued that, since naturopaths were not required to, and did not, meet the educational qualifications demanded of other practitioners of the healing art, they were therefore not entitled to receive the same services and privileges as were available to such other practitioners. The Supreme Court admitted that naturopathy is a limited form of the healing art and that naturopaths were not authorized to practice materia medica, surgery or chiropractic in Florida. It held, however, that the scope of naturopathy in the use of its authorized agencies is so general as to place it in the category of one of the important schools of the healing arts. The difference between naturopaths and other practitioners, the court said, was in the method of treatment. The services to which the plaintiff claimed to be entitled pertained to aid in prognosis and therapeutic observations. They were not for the purpose of treatment but were mainly for testing and experimentation, although the results might suggest the method of treatment to be used. Many of the great discoveries in the art of healing have been wrought by experiment, the court continued, and it would be clearly discriminatory to open the door of experimentation to one school of the healing art and close it to another—especially since naturopaths were licensed and regulated by the laws of the state just as were doctors of medicine, osteopaths and dental surgeons. Furthermore there was no showing that the plaintiff was lacking in any of the essentials of his art. The defendants' motion to quash the plaintiff's petition was therefore overruled.—*State ex rel. Turner v. Baltzell et al.*, 197 So. 783 (Fla., 1940).

Society Proceedings

COMING MEETINGS

- American College of Surgeons, Boston, Nov. 3-7. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.
- American Society of Tropical Medicine, St. Louis, Nov. 11-14. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
- Associated Anesthetists of the United States and Canada, Boston, Nov. 3-7. Dr. C. J. Wells, 1932 S. Salina St., Syracuse, N. Y., Secretary.
- Association of American Medical Colleges, Richmond, Va., Oct. 27-29. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.
- Association of Military Surgeons of the United States, Louisville, Ky., Oct. 29-Nov. 1. Colonel James M. Phalen, Army Medical Museum, Washington, D. C., Secretary.
- Central Society for Clinical Research, Chicago, Nov. 7-8. Dr. Carl V. Moore, Washington University School of Medicine, St. Louis, Secretary.
- National Society for the Prevention of Blindness, New York, Dec. 4-6. Mrs. Eleanor Brown Merrill, 1790 Broadway, New York, Executive Director.
- Omaha Mid-West Clinical Society, Omaha, Oct. 27-31. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha, Secretary.
- Puerto Rico, Medical Association of, Santurce, Dec. 11-14. Dr. David E. Garcia, P. O. Box 3866, Santurce, Secretary.
- Radiological Society of North America, San Francisco, Dec. 1-5. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, New York, Dec. 6. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Southern Medical Association, St. Louis, Nov. 10-13. Mr. C. P. Lorans, Empire Bldg., Birmingham, Ala., Secretary.
- Southern Surgical Association, Pinehurst, N. C., Dec. 9-11. Dr. E. Allen Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
- Western Surgical Association, St. Paul, Dec. 5-6. Dr. Arthur R. Metz, 2449 Washington Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

22:141-286 (Aug.) 1941

- *Studies on Congestive Heart Failure: I. Importance of Restriction of Salt as Compared to Water. H. A. Schroeder, New York.—p. 141.
Production and Study of Cardiac Failure in Thiamine Deficient Dogs. R. L. Swant, R. R. Porter and A. Yeomans, Boston.—p. 154.
Changes in Rhythm of Heart During Resection of Pericardium in Chronic Constrictive Pericarditis, as Recorded Electrocardiographically. H. J. Stewart and R. L. Bailey Jr., New York.—p. 169.
Spa Treatment of Thromboangiitis Obliterans. T. J. Fatherree and C. Hurst, Soap Lake, Wash.—p. 180.
Significance of Low Voltage of QRS Complex in Precordial Leads: Comparison with Low Voltage in Limb Leads. S. Bellet and A. Kershbaum, Philadelphia.—p. 195.
Aortic Valvular Lesion Associated with Austin Flint Murmur. B. J. Gouley, Philadelphia.—p. 208.
Paroxysmal Ventricular Tachycardia: Its Favorable Prognosis in Absence of Acute Cardiac Damage and Its Treatment with Parenterally Administered Quinine Dihydrochloride. J. E. F. Riseman and H. Linenthal, Boston.—p. 219.
Quantitative Electrocardiographic Study of Digitalization. A. J. Geiger, L. F. Blaney and W. H. Druckemiller, New Haven, Conn.—p. 230.
Variable Interval Between Electric and Acoustic Phenomena in Auricular Fibrillation. A. Luisada, Waltham, Mass.—p. 245.
Further Observations on Effects of Certain Xanthine Compounds in Cases of Coronary Insufficiency, as Indicated by Response to Induced Anoxemia. N. E. Williams, H. A. Carr, H. G. Bruenn and R. L. Levy, New York.—p. 252.

Congestive Heart Failure.—Schroeder determined the comparative importance of salt and water restriction in the occurrence or prevention of the edema of heart failure in 23 patients. The patients were given weighed diets in which the sodium chloride content, the calory value, the protein content and the intake of fluid were constant for definite periods. The activity to which the patient was accustomed prior to study was not changed. Digitalis was given when auricular fibrillation with a rapid ventricular rate was present or if the patient had been taking it previously. Diuretic drugs were given only when the patient's condition demanded their use. The output of chloride in the urine was measured daily. The restriction of salt to a level below the urinary output resulted in a decrease in edema. Usually a diet containing as little as 1 Gm. of salt in twenty-four hours was sufficient to cause diuresis or forestall further edema, but the salt content of the ordinary "salt-free" diet was not low enough. When the intake of salt was sufficiently restricted, the amount of fluid taken did not usually affect the edema. Occasionally diuresis was increased when the patient was taking plenty of fluids and decreased when fluids were rigidly restricted. When renal insufficiency accompanied heart failure, a high intake of fluids caused symptoms of "water intoxication." The studies suggest that chloride restriction is important in controlling edema of congestive heart failure but that fluid restriction is of little value.

American Journal of Clinical Pathology, Baltimore

11:625-676 (Aug.) 1941

- The Clinical Pathologist. A. V. St. George, New York.—p. 625.
Acidosis and Alkalosis: Clinical Significance and Measurement by Colorimetry of Plasma Carbon Dioxide Capacity. W. G. Exton, F. Schattner and A. R. Rose, Newark, N. J.—p. 632.
Criteria for Diagnosis of Staphylococcemia. W. J. MacNeal, Frances C. Frisbee and Margaret A. McRae, New York.—p. 643.
Determination of Lead in Biologic Materials. F. L. Smith 2d, T. K. Rathmell and T. L. Williams, Philadelphia.—p. 653.
Selection of Sulfonamides for Therapy: In Vitro Method. H. Pettit, Philadelphia.—p. 669.

American J. Digestive Diseases, Fort Wayne, Ind.

8:279-320 (Aug.) 1941

- Clinical Roentgenologic Review of Literature for 1940, Pertaining to Digestive Tract. M. Feldman, Baltimore.—p. 279.
Influence of Inositol and Other B Complex Factors on Motility of Gastrointestinal Tract. G. J. Martin, M. R. Thompson and J. de Carvajal-Forero, New York.—p. 290.
Studies on Colon Irritation: Examination of Feces. B. Fantus, O. Wazasek and F. Steigmann, Chicago.—p. 296.
Id.: Effect of Bran. B. Fantus, O. Wazasek and F. Steigmann, Chicago.—p. 298.
Treatment of Idiopathic Ulcerative Colitis with Concentrated Liver Extract and Vitamin B₁. P. Shiffer, Stroudsburg, Pa., and L. K. Ferguson, Philadelphia.—p. 300.
Syphilis of Duodenum. F. Hernández-Morales and G. Ruiz-Cestero, San Juan, Puerto Rico.—p. 302.
Effect of Small Intestinal Distention on Bile and Urine Flow: Its Possible Relationship to Hepatorenal Syndrome. J. G. Schnedorf and T. G. Orr, Kansas City, Kan.—p. 303.
Pigmentation of Kidneys by Psyllium and Its Effects on Excretion: Experimental and Clinical Study. C. H. Thienes and E. M. Hall, Los Angeles.—p. 307.
Study of Functions of Stomach Following Pyloric Obstruction and Gastroenterostomy. F. Neuwelt, J. Medoff, J. Patedjl and H. Necheles, with assistance of W. Scruggs, Chicago.—p. 310.
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American Journal of Psychiatry, New York

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Comparative Effects of Coma Doses of Amorphous Insulin Administered Intravenously and Subcutaneously to Psychotic Patients. I. C. Sherman, J. C. Mergener and A. A. Low, Chicago.—p. 77.
*Effect of Nicotinic Acid in Stupor, Lethargy and Various Other Psychiatric Disorders. V. P. Sydenstricker and H. M. Cleckley, Augusta, Ga.—p. 83.
Psychopathology of Hit-and-Run Driver. L. S. Selling, Detroit.—p. 93.
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Anaphylactic Response During Insulin Shock Therapy of Schizophrenia: Detailed Case Report with Follow-Up Studies. E. N. Hinko, M. M. Fenton and H. Balberor, Eloise, Mich.—p. 140.

Nicotinic Acid for Psychiatric Disorders.—Sydenstricker and Cleckley used nicotinic acid in the treatment of 29 patients with symptoms of severe active psychosis but with no signs of pellagra. The predominating psychotic changes were manic excitement, delusions, hallucinations, disorientation and delirium tremens. Usually the response to nicotinic acid was prompt, often spectacular, whereas other previous treatment was of no benefit. The good response of 6 additional patients with various possible contributing causes would seem to leave little doubt that the real cause of the psychosis was an avitaminosis. The possible contributing causes were peptic ulcer in 1, fracture of the femur in 1, mild pneumonia in 1, use of alcohol to excess in the past in 2 and a mild sciatica in 1. The prompt and striking recovery of 3 patients showing typical psychosis of delirium tremens also leaves little doubt that the psychosis was due primarily to avitaminosis. Seven of the 29 patients experienced improvement only. The nicotinic acid therapy did not furnish a permanent solution for their psychiatric problem; 1 remained psychoneurotic and the others showed persistent intellectual and emotional impairment which apparently was related to cerebral arteriosclerosis, senility or other factors. The chief psychiatric problem of the other 22 patients was solved by the vitamin therapy. The authors' experience leads them to believe that the symptoms of many patients whose psychiatric status suggests toxic psychosis or exhaustion delirium may be relieved

by nicotinic acid therapy. In such patients, and also in those who show unexplained clouding of consciousness, a therapeutic trial of nicotinic acid may be the only means by which to determine whether or not the psychosis is due to avitaminosis.

American Journal of Public Health, New York

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- Tuberculosis Control Program for Institutions in New York State Department of Mental Hygiene R E Plunkett and W J Tiffany, Albany, N Y—p 769
- Comparative Value of Roentgenphotographic Methods R E Plunkett G W Weber and J Katz, Albany, N Y—p 772
- Epidemiology of Poliomyelitis in Detroit in 1939 F H Top, Detroit, and H T Vaughan, Ann Arbor, Mich—p 777
- Distribution of Vectors of Equine Encephalomyelitis in Massachusetts R F Feemster and V A Getting, Boston—p 791
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- Comparison of Undechlorinated and Dechlorinated Swimming Pool Waters Twenty Four and Forty Eight Hour Plate Counts of Samples T M Riddick, New York—p 829

Annals of Internal Medicine, Lancaster, Pa.

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- Industrial Hygiene in National Defense Program J J Bloomfield, Washington, D C—p 165
- Control of Infectious Diseases in Rapidly Mobilized Troops A P Hitchens, Philadelphia—p 172
- Mechanisms of Peripheral Circulatory Failure C J Wiggers, Cleveland—p 178
- *Pneumonia of Friedlander's Bacillus L A Julienne, St Louis—p 190
- *Weil's Disease Report of Three Cases, Including Morbid Anatomy of One Case and Brief Review of Pertinent Literature J J White and J V Prevost Philadelphia—p 207
- Therapeutic Studies in Hyperthyroidism P Starr and H Pomeroy, Chicago—p 226
- Acute Hepatitis of Alcoholism Clinical and Laboratory Study H B Cates, Los Angeles—p 244
- *Sigmoidoscopic Diagnosis of Periarthritis Nodosa J Felsen, New York—p 251
- Some Problems Confronting the Physician in Examination of Automobile Drivers L S Selling, Detroit—p 265
- Clinical Studies with Aid of Radiophosphorus III Absorption and Distribution of Radiophosphorus in Blood of Its Excretion by and Its Therapeutic Effect on Patients with Polycythemia L A Erf, Berkeley, Calif and J H Lawrence, San Francisco—p 276
- *Experiences in Treatment of Subacute Bacterial Endocarditis with Sulfanilamide Sulfapyridine and Sulfathiazole Review of Previously Reported Cured Cases with Report of Fifteen Treated Cases Including One Cure and One Aborted Case H E Heyer and F K Hick, Chicago—p 291
- American Board of Internal Medicine as Factor in Scholarship in American Medicine E E Irons, Chicago—p 304

Pneumonia of Friedlander's Bacillus.—According to Julienne, study of the literature indicates that Friedlander's bacillus is responsible for a small proportion of the total of pneumonias. In an aggregate of 17,260 cases of pneumonia observed by fourteen different authors and their associates, Friedlander's bacillus was the causative factor in from 0.6 to 1.3 per cent. An average of the composite statistics, 196 cases, reveals that roughly 1 in each 100 cases was ascribed to Friedlander's bacillus. The same evidence reveals the infection to be highly fatal. The infection usually occurs among individuals of middle and old age. It is extremely rare in infants and children. This predilection is unexplained. Similarities exist between Friedlander's and pneumococcal pneumonia, the essential difference between the two being tissue destruction in the former, leaving permanent testimony of past infection. In Friedlander pneumonia therapeutic reliance should probably be placed on antiserum. Reinmann lists Friedlander's pneumonia among the infections in which sulfonamide compounds are of doubtful value.

Weil's Disease.—White and Prevost report 3 proved cases of Weil's disease. The infection in each was definitely associated with rats. In reference to case 2 they demonstrated *Leptospira* in a living and in a dead rat from the immediate vicinity. In all 3 the disease had an acute onset which caused the patients to go to bed for several days, during which the

acute symptoms gradually subsided and jaundice became manifest in from two to seven days after the onset. The patients claimed that the pruritus accompanying jaundice was the most disturbing symptom. A hemorrhagic diathesis appeared in the first patient nine months after he acquired the infection and thus seemed to be directly responsible for his death. The hemorrhages were traced to the gallbladder mucosa, although the entire gastrointestinal tract exhibited petechial hemorrhages. Two patients complained of mild epigastric pain and nausea and 1 of myalgia. The bile pigments in the stools were indirectly proportional to the rise and fall of the icteric index values. Hepatic enlargement occurred in the 2 male patients but was absent in the female. *Leptospira* was demonstrated in the blood of each patient by darkfield examination. The method described by Friedman for obtaining darkfield preparations of *Treponema pallidum* from gonorrheal discharges was highly advantageous and satisfactory, especially for obtaining blood serum from dead guinea pigs. Organisms were present in the blood after the ninth day. This is contrary to the findings of Inada and others. *Leptospira* was seen only in the urine of the second patient and this on the twenty-second day of the disease. The contents aspirated from the gallbladder of the first patient at cholecystogastrostomy for probable obstruction of the common duct contained *Leptospira*, which was demonstrated by darkfield examination on the sixty-first day of the disease. This is probably the first case in which *Leptospira* was demonstrated in bile. The gallbladder may act as a focus of infection and the patient may become an asymptomatic carrier. Prothrombin deficiency might play a part in some of the hemorrhagic manifestations of the disease. Liver extract is of great value in the symptomatic therapy.

Sigmoidoscopic Diagnosis of Periarthritis Nodosa.—Felsen describes a case of periarthritis nodosa clinically established by sigmoidoscopy and confirmed at necropsy. Two other cases which provide clinical and pathologic material for a better understanding of the changes observed at sigmoidoscopy are presented. There were many opportunities for sigmoidoscopic studies of the patient, a woman of 45, complaining of asthma following a cold in September 1935. At the first examination there were noted in the rectosigmoid peculiar horizontal, linear, dark red parallel streaks approximately 1.5 cm in length separated by approximately 1 cm of healthy mucosa. Examination with a telescopic device and green filter disclosed that between the proximal and distal points the vessel appeared to be belled out, and the inference was that it represented a thrombosed artery. At two follow-up examinations the lesions were still present, and in addition there was a definite elevation of the mucosa over the affected vessels. Several small focal areas of thrombosis were seen in the affected and unaffected vessels corresponding anatomically to the end branchings of the sigmoid and superior hemorrhoid branches of the inferior mesenteric and middle hemorrhoid branches of the internal iliac arteries. Clinical symptoms indicated involvement of larger, extramural arteries as the collateral circulation within the intestinal wall was sufficient to maintain an adequate blood supply. Correlated studies of the intestine of other cases of periarthritis nodosa at necropsy revealed lesions almost identical with those seen in this living patient. The patient's course was rapidly downhill. Neurologic examination in December 1936 revealed optic nerve atrophy and left wrist drop with sensory impairment. The diagnosis was psychosis with somatic disease. Moderate cyanosis of the lips and finger nails was present. The neck veins were engorged and there were several small hard nodules on the right side of the forehead. Neurologic study indicated median nerve paralysis. The patient died on Dec 30, 1936, approximately sixteen months after the onset of illness from bronchopneumonia and heart failure. Necropsy revealed periarthritis nodosa of the vessels of the kidneys, liver, mesenteric diaphragm, spleen, lungs and heart, diffuse cortical renal scarring, subcapsular atrophy and chronic passive congestion of the liver, subacute suppurative pericarditis, hypertrophy and dilatation of the right auricle and ventricle, myocardial fibrosis, thrombosis of the left auricular appendage, generalized edema, ascites, bilateral hydrothorax, bronchopneumonia of all lobes, hemorrhagic infarct and severe pulmonary edema of the right lower lobe, and congestion.

Treatment of Subacute Bacterial Endocarditis.—Heyer and Hick used sulfanilamide, sulfapyridine or sulfathiazole for the treatment of 15 patients with subacute bacterial endocarditis. In 1 patient a clinical cure was obtained and in another a beginning valvular implantation seemed to have been aborted. In 13 patients the diagnosis was rheumatic heart disease, in 1 coarctation of the aorta and in 1 hypertensive heart disease. The apparently cured patient was observed for two years and nine months and when last heard from she was leading the life of her people (being a Gipsy) and traveled from Chicago to California by auto trailer without ill effects. In the other patient (well for five months) the authors believe that an implantation on the heart valve had occurred and that persistent fever and splenomegaly were due to vegetations containing hemolytic streptococci. The development of a prompt institution of reflux aortic diastolic murmur during the illness (it having been absent previously) is further evidence of acute valvular changes. Chemotherapy after the illness began probably prevented extensive vegetative growths. After sulfanilamide failed to cause a remission, sulfathiazole did so. Two of the remaining 13 patients are alive, with some fever four and eight months, respectively, after the onset of the disease. The total duration of the disease among the 11 patients who died varied from one month to two years; the average was eight and nine-tenths months. Seven of the 11 fatalities were examined post mortem. Typical vegetations, all with bacteria incarcerated beneath a fibrinous covering, were revealed. The spleens of 6 were enlarged, varying in weight from 290 to 610 Gm. They had the pulpy, soft appearance associated with septic states. Numerous infarcts were observed in the spleen, kidneys, lungs and liver. It is the author's belief that treatment with sulfanilamide and related compounds should be begun as soon as the diagnosis is made and continued as long as possible, and, if improvement does not follow one of the sulfonamide compounds, another should be tried. Only a few patients will improve or be cured, but these fortunate patients can be found only by clinical trial. In the others, remissions of varying length will probably occur.

Archives of Dermatology and Syphilology, Chicago 44:321-546 (Sept.) 1941

- Pemphigus:** Survey of 170 Patients Admitted to Bellevue Hospital from 1911 to 1941. S. Gellis, New York, and F. A. Glass, Baltimore.—p. 321.
- Id.:** Report of Seventy-Seven Cases. J. J. Eller and L. H. Kest, New York.—p. 337.
- Poikiloderma Congenitale:** Report of Case in America. Howard Hailey, Hugh Hailey and H. Clemens, Atlanta, Ga.—p. 345.
- Acanthosis Nigricans Overlying Metastatic Malignant Growths of Skin.** L. Nicholas, Philadelphia.—p. 349.
- Bullous Dyskeratosis of Keratosis Follicularis (Darier) Type.** M. H. Goodman and I. R. Pels, Baltimore.—p. 359.
- Inoculation Tuberculosis.** P. A. O'Leary and M. W. Harrison, Rochester, Minn.—p. 371.
- Lymphogranuloma Venereum:** Observations in 187 Cases at Bellevue Hospital. M. J. Costello and J. A. Cohen, New York.—p. 391.
- Keratosis Blennorrhagica:** Report of Two Cases. W. C. Herold and D. C. Smith, Charlottesville, Va.—p. 398.
- Giant Follicular Lymphadenopathy.** F. C. Combes and S. M. Bluefarb, New York.—p. 409.
- Onychomycosis Due to Aspergillus Flavus.** E. S. Bereston, Baltimore, and H. Keil, New York.—p. 420.
- Onycholysis in Fur Workers.** H. Heimann and Mabel G. Silverberg, New York.—p. 426.
- Spectrographic Analysis of Neurodermatitic Lesions: Human Magnesium Deficiency.** R. C. MacCardle, M. F. Engman Jr. and M. F. Engman Sr., St. Louis.—p. 429.
- Prevention of Transfusion Syphilis.** F. J. Eichenlaub, R. Stolar and A. Wode, Washington, D. C.—p. 441.
- Chyiasis.** O. E. L. Schmidt, Cleveland.—p. 446.
- Pigment Production by Fungi: I. Nutritive Requirements.** G. M. Lewis and Mary E. Hopper, New York.—p. 453.

Inoculation Tuberculosis.—O'Leary and Harrison present 12 cases of inoculation tuberculosis of the skin. Eight of the patients were male and 4 female; all were from 2 to 50 years of age. A possible source of infection could be determined for only 5 of the patients. In 1 patient, a veterinarian, cutaneous inoculation developed after he had been in contact with tuberculous cows. The particular type of organism present was not determined. Most of the patients had been treated for several months by their physicians; the true nature of the lesion of only 1 patient was suspected. Surgical intervention and roentgen irradiation were employed for 3 patients, and 8 were treated

with irradiation alone. The results were satisfactory after both types of treatment. Healing was usually complete within a few months. Follow-up letters from 8 patients, from two to twenty years after dismissal, reveal that not one has had a recurrence at the site of the inoculation or in the regional lymph nodes. Cutaneous inoculation tuberculosis represents the cutaneous analogue of the Ghon tubercle in the lung. Infections usually follow some abrasive injury which allows the organisms to enter. The resulting lesion may be a nodule or a chancre-like ulcer, or its appearance may be nonspecific. The primary lesion is accompanied by regional lymphadenopathy often associated with cordlike lymphangitis. Similar lesions may occur among persons who have previously had tuberculosis (pseudoprimary complex); this makes it difficult to prove that the inoculation is primary in adults. Primary cutaneous tuberculosis is to be distinguished from tuberculosis verrucosa cutis, lupus vulgaris and tuberculosis cutis orificialis, when cutaneous tuberculosis may simulate pyogenic ulcer with bubo, syphilitic chancre, epithelioma with metastasis to the lymph nodes, sporotrichosis and subacute tularemia. Inoculation tuberculosis is usually benign, as the infection is not disseminated to other parts of the body.

Venereal Lymphogranuloma.—Costello and Cohen suggest that all patients with genital lesions giving negative reactions for syphilis and chancroid and patients with nonspecific urethritis be tested for venereal lymphogranuloma. Its incidence and serious debilitating late complications could be diminished if the diagnoses of ulcer of the penis, "cause unknown," nonspecific urethritis and herpes progenitalis were made with the thought that any one of them might be the initial lesion of venereal lymphogranuloma. The disease occurs more often than it is generally thought. There were 187 patients treated in the dermatologic wards at Bellevue Hospital from 1935 to 1939. Contrary to the general belief, venereal lymphogranuloma does not consist of inguinal and anorectal types alone. Hellerstrom and Wassén recognized fifty-three primary lesions in 100 cases of the disease and Sézary and Drain thirty-nine initial lesions in 73 cases. Failure to recognize the primary lesion more frequently may be attributed to the fact that it is usually small, inconspicuous and evanescent. An unsuspected urethritis may be the first manifestation, probably following an initial lesion in the urethra. Proctitis, the forerunner of the anorectal stricture, may be an early manifestation of the disease in both sexes. The authors have treated effectively more than 25 patients with large initial doses of sulfanilamide, 80 grains (5.2 Gm.) a day for the first three days and 30 grains (2 Gm.) daily for relatively long periods. Sulfanilamide is indicated in the early stages of the disease, especially before massive suppuration and sinus formation develop. It also cures the early proctitis associated with the infection. Sulfanilamide therapy and Frei antigen appears to be the best treatment. Sulfathiazole has given equally good results. The many and varied other treatments used at the hospital, according to the authors, prove that no single method save sulfanilamide stands out.

Prevention of Transfusion Syphilis.—Believing that checking the donor for syphilis by testing the blood before transfusion is an inadequate method of protecting the recipient, Eichenlaub and his associates used in their experiments 0.01 Gm. of mapharsen in 500 cc. of blood. None of the rabbits receiving such blood or serum became infected. Of 5 inoculated with whole blood and spirochete emulsion without mapharsen, a testicular chancre developed in 1. Of 4 inoculated with serum and spirochete emulsion, testicular chancres developed in 3. Therefore it appears that the quantity of mapharsen recommended will sterilize blood known to contain spirochetes. For clinical practice the authors suggest that 0.01 Gm. of mapharsen be added to the sodium citrate solution when the blood is withdrawn from the donor. This measure may replace the routine checking of donors by Wassermann tests which are not always sufficient protection for the recipient. If the method is not used as a routine it should be used whenever there is not sufficient time to investigate the donor for syphilis or when any doubt exists as to the donor's freedom from syphilis. Of 41 reported cases of transfusion syphilis, examination of the blood for syphilis of 16 donors would not have detected its presence; in 6 the condition was in the incubation period of the chancre. In

9 there were chancres which were not discovered and Wassermann reactions were negative, and 1 donor was under active treatment for syphilis and had a negative Wassermann reaction just before the transfusion, but soon active malignant syphilis developed. In 2 other cases the emergency was too great to take time to perform blood tests.

Archives of Physical Therapy, Chicago

22:449-512 (Aug.) 1941

- Diathermy in Treatment of Irritable Colon: Preliminary Report. W. J. Zeiter and R. F. Renshaw, Cleveland.—p. 453.
Modern Physical Therapy in Otolaryngologic Conditions for General Practitioner. W. Morrison, New York.—p. 457.
Gout—Prevalent Arthritic Disease. W. M. Solomon and R. M. Stecher, Cleveland.—p. 462.
Physical Therapeutic Aids in Management of Allergic Conditions. G. W. Owen, Jackson, Miss.—p. 467.
Roentgen Therapy for Inflammatory Conditions of Eyes, Ears, Nose and Throat. U. V. Portmann, Cleveland.—p. 472.
Effect of Infra-Red Irradiation on Cutaneous Temperatures. E. C. Elkins and C. Sheard, Rochester, Minn.—p. 476.
Modifications and Effects of Static Surge and of Static Wire Brush Discharge. W. Travell and Janet Travell, New York.—p. 486.
Ion Transfer (Iontophoresis). T. G. Klumpp and H. A. Carter, Chicago.—p. 490.

Bulletin Johns Hopkins Hospital, Baltimore

69:1-78 (July) 1941

- Electromyogram in Myasthenia Gravis. A. M. Harvey, Baltimore, and R. L. Masland, Philadelphia.—p. 1.
Observations on Mode of Action of Sulfanilamide: Antibacteriostatic Action of Methionine. Eleanor A. Bliss and P. H. Long, Baltimore.—p. 14.
Studies on Chronic Toxicity of Sulfaguanidine (Sulfanilylguanidine). W. C. Corwin, New Brunswick, N. J.—p. 39.
Fate of *Treponema Pallidum* Inoculated Subcutaneously into Immune Rabbits. F. W. Reynolds, Baltimore.—p. 53.
Congenital Absence of Septum Pellucidum: Case Diagnosed Encephalographically and Associated with Congenital Amaurosis. D. L. Reeves, Los Angeles.—p. 61.

69:79-224 (Aug.) 1941

- Rate of Progression of Poliomyelitis Virus in Nerves. D. Bodian, Cleveland, and H. A. Howe, Baltimore.—p. 79.
Effect of Spinal Transection on Spread of Poliomyelitis Virus in Nervous System of Rhesus Monkey. H. A. Howe, Baltimore, and D. Bodian, Cleveland.—p. 86.
Refractoriness of Nerve Cells to Poliomyelitis Virus After Interruption of Their Axons. H. A. Howe, Baltimore, and D. Bodian, Cleveland.—p. 92.
Pathology of Early Arrested and Nonparalytic Poliomyelitis. D. Bodian, Cleveland, and H. A. Howe, Baltimore.—p. 135.
Poliomyelitis in Chimpanzee: Clinicopathologic Study. H. A. Howe, Baltimore, and D. Bodian, Cleveland.—p. 149.
*Neuropathologic Evidence on Port of Entry Problem in Human Poliomyelitis. H. A. Howe, Baltimore, and D. Bodian, Cleveland.—p. 183.
*New Treatment for Burns: Preliminary Report. K. L. Pickrell, Baltimore.—p. 217.

Entry of Virus of Poliomyelitis.—Howe and Bodian present data obtained from an analysis of the distribution of the poliomyelitis lesions in 13 human brains, 8 of which included the olfactory bulbs, in an effort to determine the route by which the virus of poliomyelitis enters. The brains were obtained from rapidly fatal cases or from cases in the late stages of poliomyelitis. One of the brains was from a patient whose death was due to acute appendicitis in the acute stage of poliomyelitis. With regard to the olfactory port in the experimental animal, lesions are found in the olfactory bulb and secondary olfactory centers only after intranasal inoculation. It is precisely in these centers that lesions are most rarely found in human cases. This tends to rule out the olfactory route as the usual port of entry for the virus in man. The distribution of lesions in the human brain does not point precisely to the actual port of ingress of the virus, but by analogy with the chimpanzee it appears that the poliomyelitis virus enters by the oral cavity, pharynx or intestinal tract. After entering the central nervous system by way of the spinal or cranial nerves the virus ascends in the brain stem, and the distribution of the lesions is practically identical with that seen in the experimental animal after inoculation by a nonolfactory peripheral port. It seems likely that in all cases of poliomyelitis except possibly in early cases of spontaneous arrest an encephalitis exists whether or not symptoms are present. Despite the severity of this encephalitis, the distribution of the lesions in susceptible centers varies but

little. The localization of the initial paralysis probably is not of significance in indicating the entrance of the virus into the central nervous system, except possibly in initial bulbar paralysis. While initial bulbar signs are most suggestive in localizing the port of entry, their absence does not rule out the cranial nerves as routes of virus dissemination. The virus in passing along the cerebrospinal axis, whether brain stem or cord, may by-pass highly susceptible motor centers in one region, only seriously to affect similar centers at more rostral or caudal levels. This sparing of susceptible centers can probably be attributed, as can the process of arrest in general, to constitutional factors inherent in the host. It was not possible for the authors to determine the precise pathway of the virus from the intestine to the central nervous system except in 1 case in which the vagus nerve was strongly suggested. In at least 1 case the nerves supplying the pharynx were the path of entry.

Sulfadiazine Sprays for Burns.—Since January Pickrell has treated 15 patients with burns extensive enough to require hospitalization and 100 burned outpatients by the following method: While the accident room surgeon is scrubbing, the burned areas are sprayed with 3 per cent sulfadiazine in 8 per cent triethanolamine. This treatment allays pain, and a narcotic may not be necessary. The burned areas are not washed but simply sprayed, and scrupulous care and aseptic technic are exercised in the débridement of blebs and loose tissue. A heat cradle is used for the hospitalized patient. The burned areas are sprayed every hour during the first day, every two hours the second day, every three hours the third day and every four hours the fourth day. By this time a thin, translucent eschar has formed and further spraying is not necessary. The progress of the healing can be followed through the eschar, and in second degree burns epithelial regeneration can be observed. Active exercise and partial weight bearing to prevent contractures are encouraged. In about ten days the edges of the eschar begin to loosen and to separate. Compresses of the sulfadiazine-triethanolamine mixture can be applied; sterile liquid petrolatum sprays followed by saline compresses allow the eschar to be removed in large sheets. In third degree burns the eschar is allowed to remain for at least two weeks. Patients with second degree burns not involving more than 20 per cent of the body surface are not hospitalized. Débridement is carried out and they are observed in the accident room for at least two hours, during which time the burned areas are frequently sprayed with the sulfadiazine-triethanolamine solution. Before discharge the lesions are covered with sterile petrolatum gauze or an ointment of 5 per cent sulfadiazine and 8 per cent triethanolamine in a stearin base. No eschar forms unless the burned area is exposed. These patients return in twenty-four or forty-eight hours, when the burns are again sprayed several times and then dressed. This procedure is carried out on return visits until the burned areas are healed. The author believes that the spray does not coagulate or destroy normal tissue. In the opinion of the surgical staff, the burned areas of the 115 patients healed more rapidly than with any form of treatment previously used at the Johns Hopkins Hospital. There were no infections among the outpatients and only two among the 15 extensively burned patients. The two infections occurred while the eschar was being compressed preparatory to removal. The only toxic reaction occurred in a child of 4 with second and third degree burns that involved more than 80 per cent of the body surface. The child entered the accident room in a dying state and died within forty-eight hours.

Delaware State Medical Journal, Wilmington

13:159-180 (Aug.) 1941

- Registration Headaches. E. Cameron, Dover.—p. 159.
X-Ray Examination of Selectees. L. D. Phillips, Marshallton.—p. 161.
Tuberculosis Does Not Recognize Appeasement. A. M. Dietrich, Marshallton.—p. 162.
Venereal Disease and the General Practitioner. T. E. Hynson, Dover.—p. 164.
Nomenclature for Diagnosis of Syphilis. N. D. Carter, Dover.—p. 165.
Selectee Examinations. R. D. Herdman, Dover.—p. 168.
Environment Sanitation in Defense Areas. R. C. Beckett, Dover.—p. 168.
Impressions Gained from Examination of Preschool Children. E. F. Smith, Dover.—p. 170.

Endocrinology, Los Angeles**28:851-1020 (June) 1941. Partial Index**

- Normal Excretion of Sex Hormones in Childhood. I. T. Nathanson, Lois E. Towne and J. C. Aub, Boston.—p. 851.
- Close Correlation of Androgen and Creatinine Excretion in Normal Children. I. T. Nathanson, R. B. Miller, Lois E. Towne and J. C. Aub, Boston.—p. 866.
- Influence of Testosterone Propionate on Somatic Growth in White Rat. H. Shay, J. Gershon-Cohen, K. Paschkis and S. S. Fels, Philadelphia.—p. 877.
- Metabolism of Human Sperm. V. Ross, E. G. Miller Jr. and R. Kurzrok, New York.—p. 885.
- Early Estrus in Cat Following Increased Illumination. A. B. Dawson, Cambridge, Mass.—p. 907.
- Technic for Assay of Estrogen by Evaluation of Human Vaginal Smears and Comparison with Urinary Estrogen Assay on Mouse Uterus. B. B. Rubenstein, Cleveland, and D. R. L. Duncan, Chicago.—p. 911.
- Inhibition of Pseudopregnancy Reaction in Rabbits with Estrogenic and Androgenic Hormones. B. Zondek and J. Sklow, Jerusalem, Palestine.—p. 923.
- Effect of Pituitary Preparations on Glycogen Stores of Fasted Mice. A. H. Neufeld and J. B. Collip, Montreal, Canada.—p. 926.
- Anterior Pituitary Hormones Which Favor Production of Traumatic Uterine Placentomas. H. M. Evans, Miriam E. Simpson, W. R. Lyons and Kaisa Turpeinen, Berkeley, Calif.—p. 933.

Journal Industrial Hygiene & Toxicology, Baltimore**23:277-352 (Sept.) 1941**

- Observations on Effect of Paint on Kidneys, with Particular Reference to Role of Turpentine. E. M. Chapman, Boston.—p. 277.
- *Etiology of Acne, with Special Reference to Acne of Occupational Origin. A. T. Jones, Lancashire, England.—p. 290.
- Renal Excretion of Industrial Chemicals: I. Urinary Lead Concentration and Blood Lead Clearance. S. S. Pinto, H. B. Elkins and J. F. Ege Jr., Boston.—p. 313.
- Ventilation in Arc Welding with Coated Electrodes. B. D. Tebbens and P. Drinker, Boston.—p. 322.
- Toxicity of Methyl, Ethyl and n-Butyl Methacrylate. W. Deichmann, Cincinnati.—p. 343.

Occupational Acne.—Jones describes a form of occupational acne in which the fundamental lesion, the comedo, is present and the condition is strictly comparable with acne vulgaris. Acne in industry has usually been mistakenly described as "chlor acne." Exposure to chlorine or to compounds containing chlorine does not always give rise to the disease. The author studied during the last six years occupational acne occurring in a chemical industry. Of a total of 2,966 workers and staff 359 presented cutaneous disease; 169 of these had acne, 37 cases of which were of occupational origin. The diagnosis of acne was established by the presence of comedos sufficiently obvious to warrant treatment. Occupational acne occurred in workers engaged in a process using molten chloronaphthalenes, in the manufacture of chloronaphthalenes or in experimental processes with chlorinated naphthalenes and chlorinated diphenyl. Exposure to the fumes of heated chlorinated naphthalenes has produced acne. It was never exhibited by workers handling the cold products within the works. The conditions necessary for the production of acne are that the chloronaphthalenes shall be present in a finely divided state, volatilized by heating, in evaporated solution or as dust. Of 150 employees exposed to constituent products, not one contracted acne. Thus acne has not arisen during the manufacture and use of chlorine. In the author's opinion most workers, if exposed for more than two or three weeks to more than slight concentrations of fumes, will become affected. Thus, of 81 workers so exposed 37 were affected. The exposure was more than slight in only 7 of the unaffected workers. The most important etiologic factor of occupational acne is the degree and period of exposure. The factor of age is not so evident as in acne vulgaris. Generally, disease developed more easily and the latent period was shorter, while the mild cases took longer to subside, in younger employees. Cleanliness is a factor of utmost importance. The precise mechanism of the production of acne remains undetermined, and in the case of acne arising from chlorinated naphthalenes it is not known whether the effect is a local one or whether it arises from absorption of the product into the body. The latent period between exposure to the products and the exhibition of acne varied from one month to two years; the average was seven months. The lesions do not appear to be produced by obstruction of the glands. Some physiologic change is evidently produced in them, i. e. hypersecretion. Repeated crops of blackheads, even with adequate treatment, occur after the worker is removed from contact with chloronaphthalenes.

In the absence of gross infection in moderate cases this period is about four months. In severe cases with infection, two or more years may elapse before the eruption subsides. The latent period, the effect of cleanliness, the absence of systemic effects and the distribution of the eruption, most generally over the cheeks and behind the ears (the nose is characteristically spared), indicate that its occurrence is due to a local effect on the skin.

Journal of Investigative Dermatology, Baltimore**4:181-258 (June) 1941**

- Nutritional Dermatoses in Rat: IV. Riboflavin Deficiency. M. Sullivan and Jane Nicholls, Baltimore.—p. 181.
- Studies with Paraphenylenediamine in Fur Workers: Reactions to Skin Tests with Dyes in Asthmatics. Mabel G. Silverberg and H. Heimann, New York.—p. 193.
- Extraction of Antigen from Molds. W. B. Sharp, Galveston, Texas.—p. 205.
- Role of Allergy in Production of Pruritus Ani: Preliminary Report. S. Schapiro and M. M. Albert, Brooklyn.—p. 219.
- Studies with Antigens: XI. Significance of Scratch Test Reactions to Purified Extracts of Ragweed Pollens. B. G. Efron and C. H. Boatner, New Orleans.—p. 227.
- Role of Bases in Ointments Used for Protection Against Sunlight. E. A. Strakosch, Minneapolis.—p. 233.
- Studies in Contact Dermatitis: V. Intrauterine Transmission to Infant of Artificially Induced Contact Type Dermatitis. M. Grolnick, Brooklyn.—p. 239.
- Skin Reactions: XI. Lymphatic Escape Following Electrophoresis of Histamine and Epinephrine. H. A. Abramson and Henriette Gettner, New York.—p. 243.
- Tick Bites—Dermacentor Variabilis (Say). L. H. Winer and E. A. Strakosch, Minneapolis.—p. 249.

Journal of Lab. and Clinical Medicine, St. Louis**26:1713-1866 (Aug.) 1941**

- Renal Aspects of Experimental and Clinical Hypertension. A. C. Corcoran and I. H. Page, Indianapolis.—p. 1713.
- Capillary Studies in Raynaud's Disease. F. Deutsch, Boston, with assistance of O. Ehrenthell and Octavia Peirson.—p. 1729.
- Excretion of Gold Following Administration of Gold Sodium Thiomalate in Rheumatoid Arthritis. E. F. Hartung, Joyce Cotter and Catherine Gannon, New York.—p. 1750.
- Studies in Bacteriophage: VI. Effect of Sulfapyridine and Sulfanilamide on Staphylococci and Bacillus Coli and Their Respective Bacteriophages. Helen Zaytzeff-Jern and F. L. Meloney, New York.—p. 1756.
- Variation of Organized Sediment Following Pyridium Administration in Urinary Infections: Technic for Study of Organized Sediment Volume. L. D. Braitherg, Chicago.—p. 1768.
- Mode of Action of Bran: I. Effect of Bran on Composition of Stools. B. Fantus and W. Frankl, Chicago.—p. 1774.

Journal of Thoracic Surgery, St. Louis**10:603-724 (Aug.) 1941. Partial Index**

- *Empyema and Unexpanded Lung Following Artificial Pneumothorax for Tuberculosis. E. P. Eglee and R. H. Wylie, New York.—p. 603.
- Differentiation Between Acute Putrid and Nonputrid Pulmonary Abscess: Its Significance in Relationship to Therapy. A. S. W. Touroff and H. Neuhof, New York.—p. 618.
- Incidence of Empyema Following Intrapleural Pneumonyolysis. E. W. Custer and A. C. Cohen, Hamburg, Pa.—p. 625.
- Chylothorax: Report of Case Arrested by Phrenicotomy. S. J. G. Nowak and P. N. Barton, Boston.—p. 628.
- Studies on Etiology of Postoperative Pulmonary Complications. G. E. Lindskog, New Haven, Conn.—p. 635.
- Fat Embolism as Postoperative Complication of Extrapleural Thoracoplasty: Report of Two Proved Cases and Five Suspected Cases. B. N. Carter, J. N. Christiansen and J. A. Prior, Cincinnati.—p. 641.
- Congenital Atresia of Esophagus with Tracheoesophageal Fistula: Report of Successful Extrapleural Ligation of Fistulous Communication and Cervical Esophagostomy. N. L. Leven, St. Paul.—p. 648.
- Precise Localization of Pulmonary Abscess: The "Spot" Method. C. B. Rabin, New York.—p. 662.
- When Is Oleothorax Indicated? R. J. Collins and G. F. Skinner, Saint John, N. B.—p. 675.
- Thoracoplasty in Tuberculous Diabetic Patient: Clinical Study. G. C. Thosteson and R. M. McKean, Detroit.—p. 682.
- Helium in Anesthesia and Therapeutics, Particularly in Thoracic Surgery. E. P. Smart, Murphys, Calif.—p. 709.

Empyema and Unexpanded Lung.—According to Eglee and Wylie, there were admitted to Bellevue Hospital during the last five years 137 patients with tuberculous and mixed tuberculous empyema, representing 0.91 per cent of 15,000 tuberculosis admissions, or 7.8 per cent of 1,750 given initial pneumothorax. To this group were added 30 other patients treated surgically. In 24 empyema was due to spontaneous pneumothorax. In 143 empyema followed artificial pneumothorax, and

of these 72 had tuberculous and 71 mixed tuberculous empyema. The most common mode of onset of tuberculous empyemas was a progression of persistent pleural effusions during artificial pneumothorax. Other special causes were closed pneumonolysis and neglected reexpansion. Of 20 surgically treated patients with tuberculous empyema 9 were cured, 6 died and 5 were unimproved. For 11 of the 20 patients thoracotomy had to be employed in addition to thoracoplasty. There is no adequate follow-up to the completion of treatment for empyema and reexpansion of the lung for the group treated nonsurgically. To supplement this group 98 patients from the outpatient clinic were studied in the termination phase of artificial pneumothorax; the lungs of 19 of these failed to reexpand, the lungs of 72 reexpanded and those of 7 are reexpanding. In the expanded group only 4.2 per cent had had empyema, whereas 42.2 per cent of those whose lungs failed to reexpand had had tuberculous empyema. When tuberculous empyema develops, only those patients should be selected for nonsurgical treatment who have a good collapse of the pulmonary lesion and whose lesion would permit eventual reexpansion. Among the 71 patients with mixed tuberculous empyema the mode of onset in 4 was the development of a mixed tuberculous empyema in the presence of an unexpanded lung, in 20 pyogenic infections developed during the course of treatment for tuberculous empyema and the other causes were internal pneumonolysis, refills of air, definite episodes of spontaneous pneumothorax and in 30 there was no definite cause. Of 14 patients of this group who did not receive surgical treatment 4 died in the hospital, and 2 of the remaining 10 were improved so that the empyema had been rendered sterile. The rest were unimproved at the time of transfer to other institutions and probably died. Of the 57 treated surgically 27 died, 10 were cured, 7 were improved and 13 were unimproved. Of the 27 who died, 6 died directly from the effects of the operative procedure and 18 of sepsis or progressive tuberculosis. The cause of death of 3 patients could not be determined. The author concludes that artificial pneumothorax should be instituted in municipal clinics only when there is an associated hospital, and follow-up should be continuous. Persistent effusion during artificial pneumothorax should be a warning, and subsequent treatment should be carefully considered. Tuberculous empyema during artificial pneumothorax is a serious complication, and the best opportunity for cure rests in collapse of the pleural space and underlying lung by thoracoplasty at this time. Mixed tuberculous empyema without bronchopleural fistula must not be treated surgically unless pyogenic infection and sepsis is controlled within a week by nonsurgical means. Mixed tuberculous empyema with bronchopleural fistula must be treated immediately by surgical drainage followed by thoracoplasty.

Kansas Medical Society Journal, Topeka

42:325-368 (Aug.) 1941

- Emergency Abdominal Conditions Among Infants and Children. R. J. Kennedy, Rochester, Minn.—p. 325.
Prolonged Labor. L. A. Calkins, Kansas City.—p. 331.
Recognition and Management of the Functional Diseaser. R. Sohlberg Jr., McPherson.—p. 334.
Management of Menopausal Syndrome with Stilbestrol. L. K. Zimmer, Lawrence.—p. 339.
Iron Deficiency Anemia. E. L. Mills, Wichita.—p. 344.
Dentistry as It Pertains to Medicine. C. J. Wilson, Hays.—p. 348.

Minnesota Medicine, St. Paul

24:613-708 (Aug.) 1941

- Review of Forty-Seven Years of Surgery of Biliary Tract. A. Schwyzer, St. Paul.—p. 625.
Tuberculosis in Silicotic Subject. L. U. Gardner, Saranac Lake, N. Y.—p. 633.
Fistulas Between Urinary Tract and Vagina. J. C. Masson and R. B. Wilson, Rochester.—p. 637.
Minnesota Serologic Evaluation Study: Committee Report. H. E. Michelson, Minneapolis.—p. 643.
Treatment of Intracapsular Fractures of Femur with Smith-Petersen Nail: Report of Twenty-Two Consecutive Cases. O. W. Holcomb, St. Paul.—p. 650.
Treatment of Neurologic Changes Complicating Pernicious Anemia. H. W. Woltman and F. J. Heck, Rochester.—p. 653.
Staphylococcus Aureus Meningitis with Recovery. B. Street, St. Cloud.—p. 658.

Southwestern Medicine, El Paso, Texas

25:197-228 (July) 1941

- Medical Preparedness. H. D. Corbusier, Plainfield, N. J.—p. 197.
Venomous Nature of Some Arthropods of Arizona. H. L. Stahke, Mesa, Ariz.—p. 202.
Behavior Problems in Children. M. K. Wylder, Albuquerque, N. M.—p. 204.
Gold Therapy in Chronic Atrophic Arthritis. H. E. Thompson and B. L. Wyatt, Tucson, Ariz.—p. 207.
Dangers of Sulfanilamide. C. G. Salisbury, Ganado, Ariz.—p. 208.

Surgery, St. Louis

10:207-368 (Aug.) 1941

- Treatment of War Burns. C. P. G. Wakeley, Hants, England.—p. 207.
Shock in Perforated Peptic Ulcer: Survey Based on Some 335 Cases from the Four Surgical Divisions of Bellevue Hospital from 1929 to 1938. L. Soutter, Boston.—p. 233.
Submucous Lipomas of Stomach. M. J. Rumold, Kansas City, Kan.—p. 242.
Toxicity of Intestinal Content and of Transudate from Obstructed Loop. F. C. Hill and M. E. Stoner, Omaha.—p. 250.
Intussusception in Adult Due to Submucous Lipoma of Ileum. T. W. Botsford and F. C. Newton, Boston.—p. 265.
*Colonic Spasm as Cause of Intestinal Obstruction. R. Colp, New York.—p. 270.
Emergency Laminectomy for Acute Epidural Abscess of Spinal Canal: Report of Four Cases with Recovery in Three. D. H. Echols, New Orleans.—p. 287.
Pyogenic Infections of Spinal Epidural Space: Consideration of Anatomic and Physiologic Pathology. J. Browder and R. Meyers, Brooklyn.—p. 296.
Ruptures of Pectoralis Major Muscle. E. J. Pulaski and B. H. Chandlee, Philadelphia.—p. 309.
Dupuytren's Contracture: Operative Correction by Use of Tunnel Skin Graft. H. L. Skinner, Baltimore.—p. 313.
Further Observations on Etiology of Vasomotor Disturbances Following Peripheral Nerve Section. L. N. Atlas, Cleveland.—p. 318.
Apparatus for Prevention of Postoperative Circulatory Stagnation. H. D. Cogswell and C. A. Thomas, Tucson, Ariz.—p. 323.
Catgut and Collagen. H. Feriz, Amsterdam, The Netherlands.—p. 326.

Colonic Spasm and Intestinal Obstruction.—Colp discusses 5 cases of obstruction of the large intestine in which preoperatively a diagnosis of a malignant condition was made but in which subsequent events warranted the diagnosis of muscular spasm as the cause of obstruction. The more common variety of cases is that in which the muscular contraction appears to be localized to a small area of the colon. No area of the intestine appears immune. In 1 of the author's patients the area just distal to the cecum was spastic. The sexes appear equally susceptible. The ages of the 5 patients were respectively 48, 60, 71, 70 and 81 years. The history is similar to that obtained from any patient suffering from an intestinal obstruction. There is little, if anything, to differentiate it from an ileus due to intrinsic and extrinsic obstructing lesions. The character, intensity, the type of pain, degree of vomiting, obstipation and the extent of the abdominal distention vary according to the site of the lesion and the degree and extent of the muscular spasm. The patient does not appear to be acutely ill. Occasionally the spastic intestine may be palpated as a hard, firm tumor. This is subject to variations, as the mass may entirely disappear at subsequent examinations or it may appear to migrate to other quadrants of the abdomen. Colonic roentgenograms and fluoroscopy may be of some aid in the differential diagnosis; the characteristic findings are not usually those ascribable to a malignant condition. As the diagnosis of a spastic ileus of the large intestine is rarely made, the therapy is usually that accorded any patient suffering from an acute intestinal obstruction. If there is definite roentgen evidence that the small and large intestines are dilated, a decompression with the Miller-Abbott tube may be tried. Successes have been obtained by the use of drugs. Ileostomy, cecostomy and colostomy proximal to the obstruction have often been life saving. However, before any subsequent operation is undertaken to remove a primary constricting lesion postoperative roentgenograms should verify the cause of the obstruction. This simple expedient may save the patient an unnecessary procedure. If either an ileostomy or a cecostomy is to be performed, the tube may be withdrawn when the normal function of the intestines has been established. For some unknown reason the spasmodic episodes do not recur following surgical intervention, and most of the patients who have been followed for years remain well.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:75-108 (July 19) 1941

- Problems of Circulation. R. J. S. McDowall.—p. 75.
Incidence of Dyspepsia in Military Hospital. J. H. Hutchison.—p. 78.
Gastropapillomatosis Due to Vitamin A Deficiency Induced by Heated Fats. S. Beck and P. R. Peacock.—p. 81.
Cardiac Massage for Impending Death Under Anesthesia. H. Bailey.—p. 84.
"Blue Drum" or Idiopathic Hemotympanum in Children. J. H. O'Donnell.—p. 86.

2:109-148 (July 26) 1941

- Depressive States in the Soldier: Their Symptoms, Causation and Prognosis. R. F. Tredgold.—p. 109.
Classification of Cases of Albuminuria. A. Lyall.—p. 113.
Hyperthyroidism: Relation of Basal Metabolism to Clinical Signs. A. B. Anderson.—p. 117.
War Difficulties in Diabetic Diets: The Line-Ration Scheme. R. D. Lawrence.—p. 118.
An Abdominal Catastrophe Which Did Not Take Place. G. E. Parker.—p. 119.

2:149-186 (Aug. 2) 1941

- *Toxicity of Sulfonamide Drugs to Cells in Vitro. F. Jacoby, P. B. Medawar and E. N. Willmer.—p. 149.
*Origin, Diagnosis and Management of Early Bronchogenic Tuberculosis. G. G. Kayne.—p. 154.
Employment of Air Raid Noises in Psychotherapy. F. L. McLaughlin and W. M. Millar.—p. 158.
Chemotherapy in Acute Middle Ear Disease: "Masked Mastoiditis." C. A. Hutchinson.—p. 159.

Toxicity of Sulfonamide Derivatives to Cells in Vitro.

—Jacoby and his collaborators determined the in vitro toxic effect of sulfanilamide, sulfathiazole, sulfapyridine and sulfadiazine on living fibroblasts, macrophages and epithelial cells when the drugs are used locally. The drugs were applied in concentrations ranging from saturation strength downward and for periods between fourteen hours and three days. At equal concentrations, sulfathiazole is the most toxic. However, the effective toxicity under clinical conditions is determined by the relative solubility of the drugs and in decreasing order is sulfanilamide, sulfathiazole, sulfapyridine and sulfadiazine. The growth inhibition and unfavorable morphologic effects produced by the highest concentrations of sulfathiazole are followed by complete recovery after the drug is removed. Cells do not tolerate prolonged subjection to the highest concentration of sulfanilamide, but recovery readily takes place from concentrations of 1:150 downward. The inhibition of sulfapyridine and sulfadiazine in saturated solution at body temperature is not significant. The feeble inhibitory action of the sulfonamide drugs is favorably contrasted with that of proflavine. There is a profound difference between bacteriologically effective concentrations and those toxic to cells. Therefore when a sulfonamide powder is being selected for direct application to wounds its relative specific bactericidal power should outweigh other considerations.

Early Bronchogenic Tuberculosis.—Kayne defines early bronchogenic tuberculosis as the smallest roentgenologically detectable focus with potentialities for liquefaction. The two common mechanisms leading to early bronchogenic tuberculosis are exacerbation of disseminated residual foci and fresh exogenous reinfection with massive doses in people with lowered resistance. Another uncommon origin is a bronchogenic sequela to a progressive chronic dissemination in the lungs. Generally, early bronchogenic tuberculosis is not associated with clinical and laboratory symptoms or signs and can be detected only by roentgen examination of apparently healthy persons, particularly groups exposed to massive infection or to circumstances which lower resistance. The focus of early bronchogenic tuberculosis must be differentiated from a primary pulmonary focus, apical Simon foci, "round foci" of dissemination and the healed residua of a previously unsuspected bronchogenic tuberculosis. It appears as a group of small foci or as a nonhomogeneous shadow. Help in deciding whether the lesion is active or not must often be obtained from serial roentgenograms. They also aid in assessing the prognosis and by finding the causative factor or factors. The mode of origin, massive contact and lowered resistance must be considered, and to some extent

treatment will depend on these factors. Institutional treatment is usually essential. When there is no sputum or no tubercle bacilli can be detected in it, strict rest in bed continued until the lesion is quiescent is sufficient unless the lesion begins to progress. If extension is evident at the end of a month of bed rest or if there is no definite evidence of regression at the end of two months, collapse therapy should be instituted without delay.

Irish Journal of Medical Science, Dublin

No. 187 241-272 (July) 1941

- Report of Tuberculin Survey Among Children in Dublin Hospitals Made by Irish Paediatric Association. Dorothy Price.—p. 241.
Tuberculosis in Dublin. Tuberculosis Committee.—p. 256.
Active Immunization Against Streptococcus Scarlatinae. R. T. Jackson.—p. 260.

Lancet, London

2:61-90 (July 19) 1941

- Quantitative Administration of Ether Vapor. R. R. Macintosh and K. Mendelssohn.—p. 61.
Oxford Vaporizer No. 1. H. G. Epstein, R. R. Macintosh and K. Mendelssohn.—p. 62.
Oxford Vaporizer No. 2. S. L. Cowan, R. D. Scott and S. F. Suffolk.—p. 64.
Performances of Oxford Vaporizers with Ether. H. G. Epstein and E. A. Pask.—p. 66.
Trichiniasis: Clinical Manifestations and Diagnosis. P. B. Beeson.—p. 67.
Blood Picture in Trichiniasis. B. L. Della Vida and S. C. Dyke.—p. 69.
Electrical Convulsion Therapy. A. M. Wyllie.—p. 71.
Air Raid Strain in Mental Hospital Admissions. I. Atkin.—p. 72.

2:91-120 (July 26) 1941

- Four Phases of Birth. J. Barcroft.—p. 91.
*Ammonia Gas Poisoning: Forty-Seven Cases in a London Shelter. M. Caplin.—p. 95.
Calcium and Phosphorus Studies in Normal People, Including Old Age. J. D. Robertson.—p. 97.
Ingrowing Toenail. H. C. W. Nuttall.—p. 100.
Treatment of Bacillary Dysentery with Sulfapyridine. G. J. Bell.—p. 101.

2:121-148 (Aug. 2) 1941

- Some Nutritional Deficiencies in Man. L. S. P. Davidson.—p. 121.
Reduction of Dust-Borne Bacteria by Oiling Floors. J. C. Thomas.—p. 123.
Punch Prostatectomy. W. E. M. Wardill.—p. 127.
Calcium and Phosphorus Studies in Thyrotoxicosis and After Subtotal Thyroidectomy. J. D. Robertson.—p. 129.
Treatment of Superficial Granulating Surface. A. Edmunds.—p. 130.

Ammonia Gas Poisoning.—Caplin discusses the signs, symptoms, therapy and course of 47 hospitalized and follow-up ammonia gas casualties. During an air raid the connecting pipe of an ammonia condenser in a brewery used as a shelter was pierced. The affected patients had mild, moderate or severe involvement of the respiratory tract. The involvement depended on the nearness of the shelterers to the pierced condenser. The symptoms of 9 mildly affected persons consisted of mild signs of catarrh limited to the conjunctivas and the upper respiratory passages, a smarting sensation in the eyes and mouth, pain on swallowing, some tightness of the throat and hoarseness. The conjunctivas were suffused, the eyelids swollen and the lips, mouth and tongue intensely reddened, dry and raw looking. The fauces presented a similar picture with the addition of edema. There was a strong smell of ammonia in the breath. The signs and symptoms of the mildly affected patients were exaggerated in the 27 who were moderately affected. There were also moist sounds in the chest, suggesting extension of the inflammatory process to the bronchi and bronchioles. In contrast to the mild cases cough was prominent and produced tenacious and, sometimes, blood stained sputum. Auscultation revealed a poor entry of air with localized and fairly generalized rhonchi. Eleven severely affected patients exhibited signs and symptoms of pulmonary edema. On admission they were shocked, restless and obviously distressed. There was slight cyanosis, intense dyspnea and a persistent coughing up of frothy sputum. The pulse was rapid and of poor volume. Generalized rales and rhonchi were audible. All patients were put to bed, if shock and restlessness were present electric cradles were provided, and 0.014 or 0.01 Gm. of morphine was given. Oxygen was administered by intranasal catheter to cyanotic patients. When moist sounds in the chest were pronounced, 0.0005 Gm.

of atropine was injected and repeated every two hours. The ammonia was neutralized with a 25 per cent solution of table vinegar given as a mouth wash and gargle, after which liquid petrolatum was swabbed on the roughened mucous membrane. In the moderate and severe cases a cocaine and epinephrine spray was used. The eyes were irrigated with boric acid lotion and a few drops of castor oil were instilled in them. The 9 mildly affected patients were fit for discharge after a few hours of rest in bed. Twenty-four of the second group improved after treatment and were evacuated within thirty hours. Within six hours of admission the other 3 patients became cyanosed and the increasing dyspnea and restlessness resembled pulmonary edema, for which the patients were treated; but their symptoms increased, and they died within thirty-six hours. Signs and symptoms of bronchopneumonia appeared on the second or third day in 9 of the 24 evacuated persons and, despite sulfapyridine treatment, 3 died within two days of the onset of symptoms. The other 15 evacuated patients had a relatively uninterrupted recovery after an average hospitalization of eight days. Four of the 11 severely affected patients gradually became worse and died within two days of admission. The 7 improved slightly under treatment and were transferred within ten hours to a base hospital; 4 of them continued to improve and were discharged after an uneventful hospitalization of nine days, and 3 became steadily worse and died within two days of being transferred. Effectiveness of civilian respirators against gaseous ammonia was demonstrated by the first aid personnel, who suffered no ill effects, and also by the shelterers, who put on their gas masks at the first suspicion of gas.

Revue Belge des Sciences Médicales, Louvain

13:129-176 (April) 1941. Partial Index

*Renal Rickets and Infantile. L. Brull, L. Dumont-Ruyters and J. Firket.—p. 129.

Renal Rickets and Infantile.—Brull and his associates investigated the mechanism of osteoporosis and the pathogenesis of the disease in 3 cases of renal rickets from the point of view of the effects of the interrelations of the parathyroids and kidneys on phosphorus and bone metabolism. All cases (ages 21, 16 and a young child) presented genu valgum and terminated fatally. In the first case, a classic picture of renal rickets was seen. The roentgen examination showed a generalized process of decalcification. The case was characterized by an increasing hypocalcemia and elevated phosphorus levels in the blood. In the other 2 cases no actual osteoporosis was observed in the roentgenograms. In the first of these 2, left cryptorchism and feminine skin texture were noted. Necropsy showed hypertrophy of the left ventricle and small atrophied kidneys with cysts. The second of these presented slight kyphoscoliosis, high phosphate retention and acidosis. The authors believe that the following factors produce or contribute to osteoporosis: (1) a mineral deficiency in the food and a (2) vitamin D impairment, connected with insufficient food ingestion due to pronounced anorexia, (3) lack of phosphorus and calcium fixation in the bones, arising from overactivity of the parathyroid glands, which in turn is due to phosphate retention, (4) and high acidosis. The relative involvement of each of these factors needs to be established in every case. The view that overactivity of the parathyroid glands reacting to phosphate retention is essentially responsible is not sufficiently demonstrated.

Giornale di Clinica Medica, Parma

22:249-324 (March 20) 1941. Partial Index

*Vitamin E in Therapy of Postdiphtheritic Paralysis. U. Butturini.—p. 249.

Vitamin E in Postdiphtheritic Paralysis.—Butturini studied two groups of 11 patients each with postdiphtheritic paralysis, one of which had an adequate amount of serum in course of diphtheria while the other had an insufficient amount. Patients of the first group were placed in three subgroups: those who had serum therapy alone, those who had serum and vitamin E and those given vitamin E alone. Patients of the second group were placed in two subgroups: those treated with serum and those treated with vitamin E. Vitamin E was

administered by mouth in daily doses which varied from 9 to 18 mg. for four or five days. Best results were obtained in patients treated with vitamin E. Paralysis of the velum pendulum regressed and disappeared early in the course of the treatment, the muscles regained strength and the cardiovascular function returned to normal. The author believes that diphtheria causes a more or less acute avitaminosis E which is the cause of postdiphtheritic paralysis. This paralysis may be combated by vitamin E therapy. He advises vitamin E therapy for prevention of postdiphtheritic paralysis in the course of diphtheria. The treatment is harmless and well tolerated. The good results from vitamin E have remained unchanged up to the present date, several months after cessation of treatment.

Policlinico, Rome

48:161-200 (May 1) 1941. Med. Sect. Partial Index

*Neurologic Complications in Course of Pernicious Anemia. R. Rubegni.—p. 167.

Neurologic Complications of Pernicious Anemia.—Rubegni studied 27 cases of pernicious anemia with complications due to involvement of the spinal cord, the peripheral nerves and the brain. The group consisted of 19 men and 8 women between the ages of 33 and 65. Paresthesia and symptoms of posterior spinal column involvement were predominant in patients with complications of the spinal cord. Loss of sexual function and sphincter disorders were observed in some cases early in the course of the neurologic complications of the benign type. In rare cases disorders of speech and parkinsonoid tremor were observed. The symptoms remained unchanged before administration of liver therapy but improved on its administration. Three patients exhibited peripheral polyneuritis which was associated with paresthesia in the first case, with lesions of the optic nerves and muscular hypotonicity in the second and with mental disorders and dysarthria in the third. Psychosis was the predominant symptom in 6 out of 7 cases with cerebral complications. A patient with cerebral complications, hypertension and paresthesia but without a psychosis had a typical attack of epilepsy during a recurrence after liver therapy. Liver extracts administered in large doses by injection and by mouth caused either disappearance or great improvement in the neurologic signs in all of the cases except those in which there were advanced nervous lesions. The majority of the patients were able to resume work, with, however, persistence of one or more neurologic symptoms and with a loss of one or more reflexes, when the latter had disappeared before the administration of the treatment. Symptoms of spinal cord involvement may vary from those which simulate a pure spastic spinal paralysis to those which simulate tabes. The peripheral types manifest themselves as various forms of polyneuritis, except when a given nerve and its branches or the posterior spinal columns are predominantly involved. In the cerebral form mental disorders predominate and epilepsy may develop in the absence of mental disturbances. Liver therapy is of value, especially when administered early, in large doses and for long periods.

Revista de Gastro-Enterologia de São Paulo

3:75-114 (Aug.) 1940. Partial Index

*Blocking of Sympathetic Nervous Supply in Therapy of Noma. S. P. Ponomarev; translation by J. Jesuino Maciel.—p. 103.

Therapy of Noma.—According to Ponomarev, noma is a typical form of nervous dystrophy due to a disturbance of the balance between the sympathetic and the parasympathetic nervous supply. The author obtained good results from blocking the sympathetic nervous supply by injecting from 50 to 80 cc. of a 0.25 per cent solution of procaine with epinephrine into the lumbar segment of the left and right sympathetic trunk alternately. From three to four injections are administered at intervals of from three to five days. Shortly after administration of the first injection the patient's general condition improves and spread of the ulcer is arrested. As the treatment progresses the necrotic tissues slough away, and healing progresses to a complete cure by the end of the treatment. It is advisable to maintain the patient under control up to the point where complete healing takes place. Noma, if not entirely controlled,

may recur, the recurrence being worse than the original attack. The author reports five cases in children between 3 and 8 years of age. There was a recurrence a month and a half after the first attack in a child who was taken away from the hospital without waiting for completion of healing. The treatment was successfully repeated. In three cases permanent results were obtained from the first series of three or four injections. The child in whom the treatment failed came to the hospital in a very grave condition.

Medizinische Klinik, Berlin

37:453-476 (May 2) 1941. Partial Index

Fractures Due to Muscular Traction and Indirect Strain. W. Wagner.—p. 453.

*Clinical Aspects of Typhus. G. Holler.—p. 459.

Pathologic Anatomy of Typhus. E. Randerath.—p. 462.

37:477-500 (May 9) 1941. Partial Index

Nutrition of Patients with Gastric Disorders During the War. F. W. Lapp.—p. 477.

*Azosulfamide Treatment of Erysipelas. H. Scharowsky.—p. 483.

*Clinical Aspects of Typhus. G. Holler.—p. 484.

Symptoms of Typhus.—According to Holler, typhus attacks all ages but its severity and mortality increase with the age of the patient. In persons over 50 the mortality reaches from 60 to 70 per cent. It runs a somewhat milder course during the summer than during the winter and is also more frequent during the winter. The present consensus favors transmission by the excreta of lice rather than by the bite, because *Rickettsia prowazekii* is absent in the suction apparatus and the salivary glands of lice whereas the excreta are highly infectious. Louse infestation is the first factor to be investigated if typhus is suspected, since the body louse is the only source of infection for human subjects. The most important symptom of typhus is the exanthem which develops between the third and sixth day of the disease. To look for the eruption the patient should be completely uncovered so that the entire body can be inspected. The face is nearly always free from the rash. The skin of the body is covered with rose or bluish spots on a mottled base. In some cases the eruption does not develop (typhus exanthematicus sine exanthemate). Typhus is characterized also by disturbances of the central nervous system. There may be a positive Babinski reflex, nystagmus, increased reflexes, paralytic symptoms, stupor, loss of consciousness, restlessness and signs of meningism. The fever, accompanied by chills, generally rises to a peak in three or four days. It then decreases slightly and remains at a more even level. In severe cases it shows considerable excursions. During the second week, even before the severe symptoms subside, the fever decreases and may disappear. It is an unfavorable sign when during the second week deep remissions alternate with hyperpyretic excursions. Uncomplicated cases of typhus usually run their course in from two to three weeks. A favorable outcome may be expected if no threatening signs develop about the middle of the second week. Since an effective specific treatment is not available, the therapy is concerned chiefly with the support of the vital functions. Cardiac remedies, particularly digitalis, are important. Collapse should be counteracted with camphor, caffeine, strychnine, nikethamide or metrazol. In restless and delirious patients lukewarm baths or spongings are beneficial. High fever may be modified by aminopyrine and quinine. Sulfanilamide preparations have been tried without effect. Sulfapyridine proved helpful in counteracting a complicating pneumonia. Blood transfusions proved helpful in severe cases. In patients weakened by starvation, vitamins and an adequate diet act as adjuvants.

Azosulfamide in Treatment of Erysipelas.—According to Scharowsky, opinions are still divided regarding the efficacy of azosulfamide in the treatment of erysipelas. He reviewed 550 cases of erysipelas, some of which date back to the time when sulfanilamide was not in use. Azosulfamide was given by mouth (2 tablets three times) and by intramuscular injection (10 cc.). The author found that azosulfamide is of value only if patients arrive for treatment at the latest two days after the onset of the disease. Azosulfamide is most effective when the treatment is begun immediately after the onset. If more than three and two-tenths days have elapsed it is no longer of value.

Münchener medizinische Wochenschrift, Munich

88:485-512 (April 25) 1941. Partial Index

Treatment of Thorax Wounds in Medical Units at Front. M. Ernst.—p. 485.

*Sulfapyridine in Treatment of Wounds. Pfister.—p. 489.

Significance of Electrocardiograms for Clinical Appraisal of Painful Cardiac Sensations. H. Lachmann.—p. 491.

Sulfapyridine for Wounds.—According to Pfister, sulfapyridine applied locally in powdered form to suppurating wounds and slowly healing ulcerations demonstrated prompt bacteriostatic and curative properties. Doses given in a 25 per cent concentration and totaling as many as 20 Gm. (equivalent to 5 Gm. of the pure drug), as well as single doses in a 1.25 Gm. concentration of the pure drug, failed to show in colorimetric and photometric tests any sulfapyridine or acetylsulfapyridine deposits in the urine. This seems to indicate that no absorption of the drug takes place when it is locally applied as a powder. No damage to the urinary system, blood, liver and nervous system was clinically observed. After elimination of the acetyl element, sulfapyridine levels were found in varying proportions according to the method used and the time interval (five, eight, eighteen, twenty-four, thirty-four hours) observed. The readings fluctuated between 1.2, 1.44, 1.52, 0.9 and 1.84 mg. per hundred cubic centimeters for the colorimetric test and between 0.5, 1.2, 0.45, 0.5 and 0.2 mg. per hundred cubic centimeters for the photometric test, the author favoring the latter. In these tests the urine had been deprived of its natural color before use in order to avoid color simulation, which might have confused the results.

Wiener klinische Wochenschrift, Vienna

54:325-356 (April 18) 1941. Partial Index

Cerebral Hemorrhage and Peptic Ulcer. J. von Baló.—p. 326.

*Vitamin B and Pernicious Anemia. W. Beiglbock.—p. 327.

Symptomatology of Spastic Constipation. H. Eppinger.—p. 333.

Atypical Case of Coronary Thrombosis. N. von Jagić.—p. 334.

*Remarks on "Gastritis." H. Kutschera-Aichbergen.—p. 335.

*Dangers of Gold Therapy. F. Nagl.—p. 338.

Vitamin B and Pernicious Anemia.—Of 4 patients with pernicious anemia for whom Beiglbock employed vitamin B, 3 responded to the vitamin alone and 1 responded to vitamin and gastric juice. The reticulocytic crisis appeared slowly in all cases and always was below the maximum. This indicates that the effect of yeast preparations is inferior to that of liver. The reticulocytic crisis and the hemopoietic effect would have been overlooked in all cases if the treatment had not been continued for so long. Apparently yeast exerts its effect much less rapidly than does liver, and cases in which yeast is discontinued after from ten to fourteen days cannot be cited as evidence of failure. Studies on the sternal punctate disclosed that there is no essential difference between the effect of liver and of yeast preparations, except that the latter act much more slowly. It is noteworthy that the soreness of the tongue, funicular myelitis and polyneuritis disappeared earlier; that is, before the blood picture became normal. All patients gained weight. The question as to whether connections exist between the vitamin B complex and pernicious anemia is answered in the affirmative.

Gastritis.—Kutschera-Aichbergen stresses the fact that inflammatory changes of the gastric mucosa alone do not produce clinical signs of illness. The characteristic syndrome of gastritis appears only when a number of functional disturbances concur with the microscopic changes. The gastric mucosa is almost never injured by the ingesta. Gastric lesions develop more often indirectly, by way of the circulation, as for example in nicotine gastritis. In the presence of a hypersensitive nervous system the stomach is the organ in which reaction is most likely and most severe. External nervous stimuli are discharged in the stomach in the form of sensory, motor and secretory disturbances. These stimuli originate either in other diseased organs (intestine, liver or bile passages) or in the central nervous system. Neurologically elicited secretory disturbances may be followed later by organic changes in the gastric mucosa. If the clinical syndrome of gastritis is encountered, the primary cause should be searched for first outside the stomach, before a gastric lesion is thought of. A psychogenic origin is possible even in those cases in which secondary organic changes are already present. In the treatment the extragastric primary

causes should receive more attention than the local changes in the gastric mucosa. The curative action of the so-called stomach protective diet is due less to the sparing effect on the gastric mucosa than on the intestine and liver.

Dangers of Gold Therapy.—Nagl shows that, since its introduction twenty-eight years ago, gold therapy has found many indications. It is used in various tuberculous processes, polyarthritis, cutaneous disorders, asthma, actinomycosis and multiple sclerosis. In view of the dangers involved, caution is necessary in the selection of cases and in the dosage. Complications on the part of the skin, the mucous membranes and the gastrointestinal tract are most frequent, but those of the liver and the kidney are more serious. Repeated urinalyses and functional liver tests are therefore indispensable in the course of prolonged gold therapy. The hemopoietic system needs watching, since cases have been reported in which gold preparations have caused impairment of the bone marrow with subsequent granulocytopenia and hemorrhagic aleukia with fatal outcome after small doses. In connection with the bone marrow impairment, it is noteworthy that gastrointestinal disturbances are the most frequent complications, the close connection between the gastrointestinal and bone marrow function being well known. Since improper absorption often leads to avitaminosis and this in turn influences the bone marrow, and since poisoning with heavy metals is much better tolerated when vitamin B₂ is given, a combination of gold therapy with administration of vitamin B₂ is advisable.

Bulletin of the Naval Medical Association, Tokyo

30:323-396 (June) 1941. Partial Index

- *Gunshot Wounds of the Abdomen. S. Fukuda and M. Usuda.—p. 347.
- *Studies on Wounds: I. Clinical Observations of Hemothorax Due to Gunshot Wounds of the Chest. K. Kakisaka.—p. 357.
- *Yoshida's and Brösamlen's Reactions in Apparently Normal Men with Persistent Acceleration of Erythrocyte Sedimentation Rates. S. Ashihara.—p. 370.

Gunshot Wounds of the Abdomen.—Fukuda and Usuda report their observations in 27 cases of gunshot wounds of the abdomen treated on a hospital ship, comprising 5 cases of liver wounds and 23 cases of perforating injuries of the gastrointestinal tract. In 1 case there were injuries of both liver and intestine. Ten cases of gastrointestinal injury terminated fatally, including 1 with combined injuries of liver and intestine, while recovery occurred in all cases of exclusive liver injury. The authors agree with the opinion of A. W. Meyer, who considered one and a half days to be the maximal period allowable from the moment of injury to the time of surgical repair in order to entertain hope for recovery. In cases of gunshot wounds of the liver the most striking clinical symptom is pallor due to intraperitoneal hemorrhage. The authors aspirated as much as 250 cc. of blood from the abdominal cavity of 1 patient and report a beneficial effect from transfusing the blood so obtained after citration and filtration.

Hemothorax Due to Chest Wounds.—Kakisaka made clinical observations in 19 cases of hemothorax following gunshot wounds of the chest with only one fatality. The average time of recovery was one hundred and thirty-one days, and in most cases no complicating pleuritis was noted, although 2 subjects developed empyema. Physical examination of the chest in these cases revealed dullness and succussion sounds quite similar to those associated with pleural effusions. Anemia and leukopenia are usual findings, which over a period of about forty-eight days gradually return to normal levels with progressive absorption of the intrapleural fluids. Pleural pain, dyspnea and hematemesis were relatively common. The majority of these patients showed spontaneous arrest of hemorrhage, although in one instance hemorrhage recurred on the twenty-second day. Measurement of the vital capacity of the lungs offers the best means of prognosticating the course since with recovery there is a gradual increase in the capacity from about 1,000 cc. to the normal values.

Yoshida's and Brösamlen's Reactions in Sedimentation.—Using 10 healthy individuals as controls, Ashihara tested Yoshida's and Brösamlen's reactions in 42 subjects who were also apparently normal in every respect except for persistently

accelerated erythrocyte sedimentation rates. Yoshida's leukopenic test consists in determining the degree of leukopenia induced by the injection of tuberculin, the degree of white cell count decrease roughly corresponding with the extent of tuberculous disease. Brösamlen's eosinophilic test determines the fluctuations in the percentage of eosinophilic granulocytes after the injection of tuberculin, a decrease indicating severe tuberculous infection and an increased mild infection, while in healthy subjects no changes occur. The author found that in apparently healthy individuals with constant elevation of erythrocyte sedimentation rates the Yoshida test was positive in 71.5 per cent, and only 30 per cent positive in healthy subjects having normal sedimentation rates, thus indicating a significant variation. The Brösamlen test, on the other hand, showed no significant correlation with the erythrocyte sedimentation rate. From these results the author concludes that a persistently high erythrocyte sedimentation rate in apparently normal individuals may have diagnostic significance in respect to the possibility of tuberculous infection.

Kekkaku, Tokyo

19:237-302 (April) 1941. Partial Index

- *The Takata Reaction in Pulmonary Tuberculosis. S. Haruhara.—p. 245.

Takata Reaction in Pulmonary Tuberculosis.—Haruhara reports the results of the Takata reactions performed on the blood serum of 50 patients with various forms of pulmonary tuberculosis. The test gave positive results in 60 per cent of the cases, but on comparing the results with the erythrocyte sedimentation rates as simultaneously determined the author failed to discover any correlation between these two tests. He also found that the Takata reaction is more apt to be positive in phthisis pulmonum (chronic proliferative-cirrhotic tuberculosis of the lung with exudative local foci) than in the acute form. In hematogenous cases of pulmonary tuberculosis the Takata reaction is positive in over 98 per cent. In the author's opinion the Takata test offers a reliable method of ascertaining the severity of the general constitutional injury arising from tuberculous infection, thus affording a means of controlling the prognosis of pulmonary processes.

Okayama-Igakai-Zasshi, Okayama

53:903-1178 (May) 1941. Partial Index

- *Studies on Serum Lipase and Toxicity of the Pancreas in Experimentally Induced Acute Pancreatic Necrosis. Y. Nakagawa.—p. 1061.

Lipase and Toxicity of Pancreas in Pancreatic Necrosis.—In three lengthy communications, Nakagawa reports his observations on the quantitative changes that occur in serum lipase in dogs following experimental induction of pancreatic necrosis. Of the various types of curves he obtained from lipase determinations (Willstätter, Waldschmidt-Leitz and Memmen method) the author found that a pronounced and sudden increase in serum lipase invariably produced early death of the animal, whereas a moderate and gradual increase was frequently associated with long survival. Chemical analyses of various organs for the lipase content revealed that the lungs contained the least amount of the enzyme, the liver stored it temporarily, the spleen yielded moderate values, and the greatest quantity was found in the kidneys. Some correlation seemed to exist between the degree of pancreatic necrosis and the lipase content of the organs, in that the latter tends to be greatly decreased in cases of severe pancreatic damage, while in mild necrosis tissue lipase usually increases greatly during the first twenty to thirty hours and then gradually decreases until death ensues. It is known that in acute pancreatic necrosis lipase breaks down fat into fatty acids and glycerin, and the fatty acids so produced combine with blood calcium to act as a toxic substance capable of destroying pancreatic tissue. The author estimated the quantity of fatty acids in the pancreas of dogs after their death by a modification of the Bloor-Pelkan-Allen method and found these acids markedly increased in the necrotic portion of the organ and moderately increased in hemorrhagic areas, while in edematous and healthy portions the fatty acids were either decreased or normal. In one instance of acute pancreatic necrosis in man with fatal termination, analysis of the pancreas for fatty acids also showed a significant increase.

THE STUDENT SECTION

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Our Present Concepts of Health and of Disease:

ARE THEY ADEQUATE?

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CHICAGO

Address delivered before the students and faculty of Washington University School of Medicine, St. Louis, Sept. 24, 1941.

It is a privilege, as well as a responsibility, to be with you tonight. I am considerably older than you may think. I remember the day of small things in the case of Washington University Medical School. You have been part of the extraordinary development in medical education and medical research in the United States in the last fifty years. The next fifty years in United States medicine can be equally interesting, equally challenging and equally startling. It certainly has been a privilege to live through this half century of medical progress, when America really has come into its own, not as an absorbing sponge of wisdom gathered in other lands but as actually producing new information in our own home.

I do not know what I could tell you freshmen, and I am not so much worried about that anyway, because whatever foolishness I tell you the faculty will have four years' chance to correct. I remember very well my feelings and apprehensions when I was on the freshman bench. I felt that I couldn't possibly live long enough to learn half of what my professors seemed to know. I didn't think it was possible to master it. Now part of what I am going to tell you tonight might discourage you as freshmen. If that was the feeling of a freshman forty years ago, it should be even more so today, because the addition in medical knowledge in all fields that has accumulated in the last fifty years is tremendous. And there has not been much measurable improvement in the human mind—even in that of the medical freshman.

It may be a little discouraging when I tell you that what we know today in medicine is a mere fragment of what remains to be found out. You will learn gradually that all the minutiae that seem to cover every medical problem and field

and stuff to suffocation the cerebrum in the front of the parietal lobes don't need to be all the time on the retina, in the cortex or in consciousness. When you have mastered the fundamentals you can put much of the minutiae down into the hypothalamus. Experience will call these thousand spirits from this vasty deep when you need them if you once mastered them and never forget the fundamentals. I say that without being a pupil of Freud.

Two days ago I listened to a very wise talk by a very wise physician to another group of medical freshmen in another part of the country. Among other things, he said that the medical student should learn early to develop hobbies. Yeah? If you come—and woe to the man or woman who comes in any other way—thoroughly conditioned to the philosophy of labor, then I think that there is just one hobby that is paramount to you and to me, and that is flursing of the habit of using our "noodle" all the time. I never did understand how anybody could identify heaven with leisure, with no difficult work, with the end of the opportunity of learning new things. In that respect it is my considerate judgment that you freshmen—if you endure, if you survive—are entering the most interesting, the most challenging and the hardest of the professions in our times. There is certainly for us, in biology and medicine, as for the Athenians in the days of Paul, something new to be sought and valued every day.

Dean Shaffer forced a subject on me for this talk: our present concepts of health and of disease, are they adequate? Maybe I can focus the point of my discussion a little by referring in brief to two recent events in medicine and nutrition. We have heard in the last eight years from many sources that a third of our population, or roughly 40 million citizens, are underfed in addition to being poorly clothed and poorly housed. Now that has been added to recently,

so that today not 40 million but 95 million Americans either cannot get the right food or have such bad habits that they don't eat enough of the right food. If this is so, we have before us a tremendous problem of malnutrition in our once happy land! I quote here from the statement of Dr. Thomas Parran, chief of the United States Public Health Service, made at the Nutrition Congress for Defense in Washington last spring. I was there. I heard it but I am not quoting from memory: "Studies of family diets by the Department of Agriculture in all income groups of the nation show that one third of our people are getting food inadequate to maintain good health" and "less than one fourth of us are getting a good diet." What are the facts? I have been accused of always asking for evidence, and I am asking for the evidence of my distinguished friend Dr. Thomas Parran. At the same congress the Honorable Paul V. McNutt added much more. Mr. McNutt is the administrator of many of our federal welfare bureaus, including the Public Health Service, dealing with these problems. Mr. McNutt said: "Stamina, intelligence, judgment, will, stability may have their roots in vitamin unbalanced diets, and can be treated through clinically determinable doses of synthetic vitamins." Did you get that?

I think Mr. McNutt meant "vitamin balanced diets," but the statement that disorder in these fields "can be treated through clinically determinable doses of synthetic vitamins" seems clear enough. It pains me to say that this is a mouthful of administrative medicine and political science from a public official trained in the law. And then he supports this with the usual lay testimonials of quackdom. I quote again from Mr. McNutt's speech: "Recently I was told that a Western Trucking Company had actually achieved a reduction of its night accident rate by providing all its drivers with bags of raw carrots at the beginning of each trip." Well, now, don't laugh. These are tragic things, because it is said by government leaders in our field. To me it looks like a sin against science. It may frighten our fellow citizens. It certainly will encourage quackery and put many dollars into the pockets of the vendors of synthetic vitamin pills. That synthetic or natural vitamins will empty our insane asylums and our prisons—for who will argue that crime is an act of intelligence—that I shall accept when I see it. There is probably a little rabbit down that hole, but in the name of sanity and science let us do more digging and less talking till we actually have that rabbit in our hand.

Now we are not told what the truck drivers did with those bags of carrots. Did they hang them around their necks, or did they chew and

swallow them? Or was this little item not checked? If they chewed the carrots, somebody who knows should have told Mr. McNutt and the officers of the trucking company that chewing carrots or chewing the rag are aids to keeping awake, no matter what it may do for the rhodopsin of the retina.

It is regrettable that a physician, with the standing and responsibilities of Dr. Thomas Parran should take the absence of knowledge as the basis for the statement that less than 25 per cent of the population of these United States eats adequately or eats right, when we do not even know what is the optimum diet for man through the changing periods of his life. Hazel K. Stiebeling of the U. S. Department of Agriculture, who has had a large responsibility in the conduction and interpretation of our federal nutrition surveys, points out in last year's *Annual Review of Physiology* that one of the crying needs of today is the development of methods through which we may detect the possible if not probable injuries from faulty diets before the well known and now recognizable deficiency diseases are on us. If, as it seems to me, Dr. Parran and Mr. McNutt left the reservation of scientific medicine in one direction, my good friend Dr. Logan Clendenning of this state leaves our reservation at the opposite point of the compass. In the last number of *THE JOURNAL*, Dr. Clendenning presents in a brief piece of correspondence (which I hope all of you will read, if you have not done so) quite a few statistics from many clinics and from able physicians all over these United States, to the effect that the number of actual cases of vitamin deficiencies are astonishingly small in our land, and he gives the inference from this small number that we have no serious vitamin deficiency problem before us. In my judgment, both Dr. Thomas Parran and Dr. Logan Clendenning sin against the scientific method. We should stick to facts. We should be as modest as the good clinician who in doing a physical examination goes over every organic system with the best tests now available. He goes over the heart, the chest, the intestine, the kidney, and what does he put down on the record? Heart—does he write healthy? No. Heart, negative; kidney, negative; intestine, negative. That means he has not found recognizable disease. He does not give a positive affidavit that everything is all right. In most of these examinations we do not put the individual organ or the patient as a whole on stress, and we have no measure of how far his factors of safety, his powers of regeneration have been impaired. I should say that our present conception of disease is fairly adequate. But it is still provisional. It is far more adequate than our con-

ception of health, because our conception of health is essentially the absence of clinically recognizable disease. And we now know that, starting out with the reserves, with large factors of safety, with great capacity for regeneration in many tissues, we may sustain a great deal of damage before recognizable disease appears.

We have now solved the riddle of many of the diseases that baffled us fifty years ago. We haven't controlled all of them but we understand them in part. Among these are pernicious anemia, diabetes, endocrine disorders and the dietary deficiency diseases. Now that that is partly done, there remain the virus diseases, there remains cancer—yes, there remain many troubles, to be sure—but it seems to me that the next big step, the next huge terrain to tackle is that involving better methods for determining initial damage to, and the degree of loss of, our reserves, because that, and that alone, will make periodic physical examination of the so-called healthy people mean something. That, and that alone, will give us an approximate definition of health. This is nothing new, nothing startling. In *Science* a few months back, Dr. W. B. Cannon of Harvard University, who is one of the many ornaments of the last fifty years of American Medicine, presents a paper—which I hope every freshman will read; my colleagues, of course, have read it, and so have the sophomores and the juniors and the seniors—entitled "Problems Confronting Medical Investigators." He outlines what we need, only in different words and with different emphasis. I would not call them problems confronting medical investigators; I would call them problems confronting medicine, problems confronting us all, problems confronting society. I believe, to be sure, that the medical investigators form the spearhead of the advance. And it is going to be somewhat more difficult and costly to do the work of the next fifty years, than some of the things accomplished by the past generation.

In retrospect, some of the things look simpler than what is facing us now, particularly the teaching of medicine, always a privilege, to be sure. To me teaching is a great privilege, but it would not be so challenging except for the fact that some time, somewhere, in St. Louis, Boston, Chicago, San Francisco or Baltimore, there is going to sit on the freshman bench a man or a woman who will do greater things than Pasteur, and Koch, and Harvey, and Minot. But all the work in conquering these new frontiers cannot and will not be done by those few.

I think that our next generation of physicians will probably do better than did we, provided we retain our sanity, our courage and our freedom. For science is the creation of free men, with superior intelligence, great industry, patience and courage through the ages. In our early training let us really get conditioned to the scientific method. Let us never forget that, except for a few superficialities, every patient meeting us is a scientific problem challenging analysis. If, in addition, we keep both feet on the ground all the time, we will never commit any great sin against science, any grave crimes against the tradition of our craft.

What I have said so far may stir some of my colleagues in the science and art of medicine to say "Carlson himself has gone off the reservation." I know perfectly well that the term "sub-clinical disease," an assumed ailment that no present objective criteria can detect but perceived by the seventh sense of the soothsayer is also the concept and the method, the universal method, of the medical quack. But while the term "subclinical disease" is a misnomer, we in the science and art of healing must begin our work much earlier. We must not wait for the time when the reserves are so depleted and the person is so sick that he comes to us. We must redefine our concept of health. When that is done on a factual basis, the concept of disease will take care of itself.

Digests and Reviews

THE STUDENT AND THE EMERGENCY MEDICAL SERVICE

By John A. Ryle, M.D., *Regius Professor of Physic, Cambridge University. Slightly condensed from the Lancel, Aug. 30, 1941.*

Two years have now passed since the medical student—and particularly the student in London—faced an abrupt disorganization of his educational program and an enforced rearrangement of his life and habits. Good humored and adaptable for the most part, the earlier days of war found him ready to accept much. He grumbled probably no more and, having fewer

responsibilities, possibly less than his teachers and others among the general public who stood, not fearful but puzzled and anxious, on the brink of our new era of world catastrophe. Of one responsibility and one decision he was relieved, for the government decided to regard him as coming within the category of the reserved occupations. Already the voracity of the armed forces for doctors and yet more doctors has seriously depleted the civilian services and seems likely before long to claim every fit medical man directly on completion of his six months' qualified apprenticeship as a house officer.

At the outbreak of war, as a new and additional service working apart from the medical services of the armed forces and yet supplying the greater part of their hospital accommodation in this country as well as the war time needs of the civil population, the Emergency Medical Service came into being and developed simultaneously its association with the medical schools. It seems fitting at the beginning of a new session and of the third year of war to consider what part this service has played in the life of the medical student and what contribution the medical student can continue to make to this vast service, which has established itself and affirmed its indispensability in our national life.

CLINICAL EDUCATION MAINTAINED

In the first place, the Emergency Medical Service operating in the London sectors made it possible for the clinical education of all the medical students of London to be maintained. The parent hospitals were reduced in status and complement to casualty clearing stations in order to prepare for the air raids which fell on the metropolis last autumn; but the sectors, whether in county council hospitals or some of the larger mental or other special institutions taken over for the purpose, supplied base hospitals wherein ward teaching could continue and where, by degrees, lectures and laboratory classes could be resumed. In most sectors now there are, besides the parent hospital in town, one, two or more base hospitals in the country, and between these and the parent school the students in the clinical period are distributed. Students in the preclinical period, who at first, in several instances, enjoyed the hospitality of the provincial medical schools, were later in some cases accommodated in country houses converted for the purpose. These are situated for the most part within reasonable reach of London and the base hospitals. In the parent hospitals, students in their clinical period have had opportunities of seeing acute surgery and medicine and of obtaining the experience of wounds and shock and transfusion technic provided by air raid casualties, while outpatient teaching has continued without interruption. Some of the London County Council hospitals have been generous in affording teaching facilities to neighboring London schools. Here and at the base there have been opportunities, often better than in peace time, of seeing a rich variety of material in institutions carrying a large quota of chronic and old age diseases.

Clinical teaching has, nevertheless, suffered in many ways. There has been a large exodus of members of the teaching staffs to join the military services. There has been separation from libraries and laboratories and, during the

tenure of appointments at the base, from the valuable opportunities which the outpatient clinics provide. And there has been the continuing sense of unrest and uncertainty militating against reading and calculated to distract the most studious mind. In other ways, however, clinical education has discovered unanticipated boons. Thus the student in many places has found himself living at close quarters and in a more democratic association with his teachers and in friendly unofficial ways acquiring information and an outlook on the problems of his chosen profession which the formal associations of the peace time teaching round could seldom supply; the value of the whole time teacher has been made apparent in this way. He has found or should have found new chances of self instruction from hours spent on his own in wards replete with cases and physical signs of a varied kind. He has seen other types of hospital organization and had glimpses of both the good and the bad in county or municipal administration. At the base he has been able to enjoy a healthier environment and, for the most part, has not been too much disturbed by the visitations of the raiders. In his London terms he has had both the surgical and the human experience of air raid nights and the satisfaction of feeling that he was here making a definite contribution to the war effort. What some of the hospitals in heavily raided areas, often themselves the victims of high explosive and of fire, would have done without the ready and willing help of students it is hard to imagine. Such tasks may not profit the attainment of the examination goal, but to have combined the duties of clerk and dresser with those of stretcher bearer, roof spotter and extinguisher of incendiary bombs is to have lived and learned and to have found in emergency and risk a new return to make for the privileges of postponed military service.

The teaching of pathology and bacteriology has probably suffered more than the teaching of the clinical subjects. Museums, class rooms and laboratories are not easily transferred to or improvised in a county infirmary or mental institution, and a falling off in examination efficiency in the laboratory sciences is more excusable on this account. By now, however, arrangements should be improving and while present stability persists a steady integration of teaching with a better adaptation to its new environments should prove possible.

In the early days of the war some schools favored the principle of dispersal and scattered their students among many institutions. This experiment has now been accepted as a failure, and the tendency is to concentrate more and more into one at most two country hospitals. The need for a shadow hospital to which an

evacuation can take place in the event of the final disruption of the home hospital by enemy action has also become apparent, and the provincial medical schools, no less than the London schools, would do well to contemplate this need.

TRADITION HAS SURVIVED

We can thus say of the Emergency Medical Service that when all tradition seemed swept away and the cherished individualities of famous schools were wellnigh lost in the process of disbanding, it provided the wherewithal of survival. The student who enters the wards of the Emergency Medical Service hospitals on the outskirts of London in the new session will scarcely be able to visualize the discomforts and shortcomings, the improvisations and sandbagging fatigues of the earlier days. If he can never savor the life and provisions of his school under normal conditions, he has instead a war time tradition to make, maintain and enhance. He owes a debt of gratitude to those who have, between them, prepared the way for him during the past two years. He should make every possible use of the human situation in which he finds himself, for by so doing he will not only be storing impressions which will help him to mold his professional outlook and conduct but will also be making a real contribution to the amelioration of difficult times and conditions. The opportunities for technical study may have deteriorated, but the opportunities for technical study of mankind and for mutual instruction and assistance were probably never better.

Out of new and strange discontents and new sympathies stirred by the pictures and stories of London's sick and wounded exiled from bombed streets and finding a haven in a county council hospital or its huddled annex, it is likely that many students will extract material to set them thinking of the future of our hospital services and our medical schools. When the time for rebuilding comes, what contribution will their generation make to the permanent abolition of those slums, now widely shattered, which once helped to provide so much of the disease that gave instruction to their fathers? Where and on what plan will the new hospitals and schools be built? Will the ghost of Sir Thomas More behold at last his hospitals "in the circuite of the citie, a little without the walles . . . so bigge, so wyde, so ample and so large, that they may seeme . . . little townes"? How far have the dislocations of the war influenced the actual work and competence of the medical student? This is hard to judge, but it would probably be the opinion of most teachers and examiners that academic attainment and practical efficiency have both suffered in some

degree. An undue dependence on the instruction of the class and the book, a shortage at times and some places of clinical and pathologic material, the dispersal of teachers and the difficulty of concentrated study under existing conditions have had effects for which strong censure would be unfair. Examiners are doing their best to be considerate and yet feel it incumbent on them to expect a reasonable and proper level of competence.

THE PROSPECTS OF STUDENTS

What are the immediate prospects of the student on qualifying? There is now no shortage of house appointments, and every man and woman must serve as a house officer for six months before seeking duty with the armed and auxiliary forces. Thereafter the choice for the men is between the army, the navy, the air force and the Emergency Medical Service, and of these the army is the most importunate. Heretofore the Emergency Medical Service has been able to retain the services of a proportion of the younger men beyond the house officer period and—since it makes hospital provision on a very large scale for the services as well as for civilians, and its efficiency depends not a little on its junior medical officers—it would seem right that it should continue to take its quota from the medical man power pool. It could be wished that there were possibilities of interchange between the Emergency Medical Service and the army. The fact that so many army doctors spend such a high proportion of their time in relative idleness tends to deter some of the young men from applying at once for commissions, but this state of affairs must be accepted as part of the inevitable wastefulness of war. For the keen medical officer there is always work to do with human interest and of high military and moral value, if only he will adapt himself to new circumstances and accept that his first duty is not now the care of "interesting cases" but the preservation of health, efficiency and morale among the fighting men.

What lies ahead of us in the coming months none can say, but certainly an intensification of effort is immediately necessary in the field of medicine and medical education as in every other field. The beginning of a new session may well be made an occasion in the councils of the schools and in student communities for fresh resolutions and planning. Could the medical student require any finer inspiration to hard and eager work than the example set him by sailors, soldiers and airmen of his own generation and by the uncomplaining civilian sick and air raid victims with whom and for whom in one capacity or another his turn to serve must shortly come?

IN SEARCH OF COLONIAL MEDICINE IN WILLIAMSBURG

An editorial slightly abbreviated from the October 1941 issue of the Virginia Medical Monthly.

The Williamsburg Restoration has been carried out in the grand manner. Virginia is proud of Mr. Rockefeller's gift to the state in restoring and preserving its heritage. No one questions the vastness of the undertaking or its accuracy in the smallest detail. There were three great professions honored and respected by our forefathers of the Williamsburg period: the law, the ministry and medicine. One does not have to go far in Williamsburg today to be convinced of the power and prestige of the law in the eighteenth century. The capitol where the law was made, the courthouse where the law was enforced, the public gaol and stocks where the law-breaker was punished, as well as the home of one of the law's great champions, George Wythe, are all proudly shown the Williamsburg visitor. The church of colonial days is beautifully and adequately revealed in the restored Bruton parish church and its quiet graveyard.

What would the visitor to Williamsburg be shown if he asked to see those things that reflect the medicine of this bygone day? He would, no doubt, be told that the Eastern State Hospital on the outskirts of the city—for the removal of which to more distant parts there has naturally been considerable agitation—is the oldest institution devoted to the care of mental disease in the United States, and that here too the treatment of the colored insane was first provided for. He would be shown the cottage of James Galt, the first keeper of the asylum, which now stands on Duke of Gloucester Street, to which it was removed in 1929.

Some of Williamsburg's leading citizens and landowners were physicians: John Anson, Andrew and Robert Anderson, Philip Barraud, Archibald Blair, Charles and John Brown, James and William Carter, Robert Davidson, John Dixon, James and John Galt, Robert Garrett, the George Gilmers (father and son), Samuel Griffin, Peter Hay, Kenneth Mackenzie, Robert Nicholson, William Pasteur, George Pitt and Robert Waller—to recall a few; but, while their names linger on in the records, for the most part the places where they dwelt know them no more.

The medical man in search of medical items of interest in colonial Williamsburg would be interested to know that the Raleigh Tavern was built by the physician Archibald Blair and that it was later owned by another physician, Dr. George Gilmer. When he is shown the Wren Building at William and Mary College the medical visitor would like to be told that here James McClurg, graduate of Edin-

burgh, later first mayor of Richmond, first president of the Medical Society of Virginia and a member of the constitutional convention, gave the first formal lectures in medicine ever delivered to students in this state.

The doctor who visits the restored capitol and palace and the grounds of William and Mary College should be told something about their medical history. Williamsburg was one of the most important Revolutionary hospital centers, especially toward the end of the war and during the Yorktown campaign. He might be told about the Vineyard Hospital, which stood on the York Road just outside the city, and that the capitol, the palace and the college housed the sick and wounded of the Continental Army. The Restoration undoubtedly wishes they had not, for, if it had not been for the fact that Revolutionary hospitals were set up in these old buildings, the Restoration's work would have been much simpler than it proved to be. Careless Revolutionary soldiers were responsible for the burning of the palace in 1781 and for the destruction by fire of the College president's house and one of the wings of the college. In the Civil War the court house, the Baptist church, Bruton parish church and many private dwellings were converted into temporary hospitals, and the main building of the college was used for a hospital in 1861 by Confederate troops and in 1862 by Federal troops.

The medical minded visitor, especially if he has seen the Hugh Mercer apothecary shop in Fredericksburg, the Leadbetter Shop in Alexandria or that unique preservation of the apothecary's art at the Medical College of Virginia in Richmond will hope to be shown an apothecary shop in Williamsburg. There were many. There was Andrew Anderson's Sign of the Golden Ball and James Carter's Unicorn's Horn and George Pitt's Sign of the Rhinoceros as well as other shops, which were operated by William Biers, William Carter, Richard Coulhard, Robert Davidson, John Galt, the two Gilmers, Peter Hay and William Pasteur.

Dr. Archibald Blair's shop, dating from 1717, has been restored. It is the oldest apothecary shop in the state. Unfortunately the interior has not been restored but has been diverted to other uses. Where once the colorful carboys, brass scales, pounding mortars, bottles large and small, and pungent odors conspired to create an atmosphere that was part of the medicine of its day, a peruker, plying a trade equally quaint to us, makes and repairs the wigs worn by the costumed hostesses, guides and servitors of the Restoration. No doubt the corporation will change all this in time.

It is at this point that medicine in Virginia, conscious of its debt to the Rockefeller restora-

tion, must, like a greedy child to whom much has been given, hold out its hands for more. Our profession is at the crossroads of its destiny, and it must plead for the preservation of every visible sign of its olden days that it may know what it has been in order to know what it should be, that it may learn what to hold fast and what to let go.

CHINESE CONTRIBUTIONS TO MEDICAL SCIENCE

Abstract of an article by Joseph Needham and Gwei-Djen Lu, published in the Cambridge University Medical Society Magazine, Easter Term, 1941.

As the history of science comes more and more to include what happened during the long Chinese civilization, it will be recognized that the Chinese were ahead of the Europeans, often by several centuries, in advances which have revolutionized society. Three of the greatest discoveries were Chinese: the compass, gunpowder and printing. The mariner's compass originated in China before the ninth century A. D. and reached Europe by a slow diffusion lasting several centuries around the south Indian trade routes. Gunpowder appeared during the T'ang dynasty, i. e. about the eighth century A. D., and its use then was restricted to fireworks. Movable block printing originated in 932 A. D., so that Feng-Tao has some five hundred years seniority over Gutenberg.

As regards medical science, the earliest idea of the physician in China was no doubt that of a benevolent wizard, willing to combat for a consideration the devils of disease whose behavior he claimed to understand. As centuries went by, a large body of practical medical art grew up, which, when the first Europeans came to know it, was too much despised. In anatomy the Chinese made little progress because of the tabu restrictions against defacing the body, the image of the venerated ancestors; but in pharmacology many valuable drugs were known. Some of these, ephedrine for example, had no representative at all in Western medicine. Other drugs, such as stramonium, were common to both Chinese and galenic pharmacopeias. The mineral remedies, such as arsenic, which the followers of Paracelsus had difficulty in introducing into Western medicine in the sixteenth century, were used by the Chinese in the thirteenth. So also was the iodine-containing seaweed and the antileprosy chaulmoogra oil. While the Chinese did not

know of the cardiac-stimulating properties of the fox-glove, they obtained a digitalis-like drug from the skins of toads. As we now know, both these classes of active principles are members of the steroid group. Most surprising is the fact that a kind of vaccination was practiced as far back as the Sung dynasty in the eleventh century; the contents of smallpox pustules were inoculated into the nasal mucous membrane, an operation called "shui-miao," or planting drops of water.

In one direction Chinese medical practice was extremely advanced: that of nutrition. Knowledge of dietary treatment of various diseases in China can be traced back as early as twelve centuries B. C. The "Record of Rites of the Chou dynasty" (about 1100 B. C.) lists not only the Imperial Physician, the Imperial Surgeon and the Regius Professor of Medicine, but also an Imperial Dietitian. The Ching Kuei Yao Lueh of Chang Chi contains vivid accounts of deficiency diseases in their various stages and describes numerous diets. This knowledge was summarized in the fourteenth century A. D. by Hu Se-Hui, who occupied the post of Imperial Dietitian from 1314 to 1330 A. D. and wrote a book called "The Principles of Correct Diet."

Hu Se-Hui even distinguished between the two forms of beriberi, known today as the wet and the dry. He gave sixty-two different diets which would supply, as we know today, the missing vitamins of the B group. The motto of his book was "Food alone cures many diseases." In face of these facts, it is somewhat piquant that recognition of beriberi as of dietary origin is usually ascribed to Takaki in 1880 A. D., an admiral of the Japanese navy. Ancient dietetic knowledge is so deeply embedded in the people in China that no distinction is made between grocers' and apothecaries' shops. Beriberi was not common in China till modern times. Anciently rice was ground in every family on the day it was used; this preserved a thin fatty layer on the grain and a large portion of the embryo which contained sufficient B₁. More study should be devoted to the contributions which Chinese civilization has made to human knowledge. These have been overlooked, partly because hidden behind a language the difficulty of which is often overestimated and partly because Chinese science was never spectacular. But in the story of the development of world culture they must be raised to their rightful position of honor.

DO YOU KNOW WHAT PHYSICIAN—

1. Identified the first diamond found at the great Kimberley Mines in South Africa?

2. Was the first surgeon in America to excise the hip joint? (The answers are on page 1484)

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items for consideration for publication in the Student Section.

Students Present Insurance Policy to Alma Mater

The class of 1941 of Georgetown University School of Medicine, Washington, D. C., presented a \$10,000 life insurance policy to the school, which on maturity will be known as the David V. McCauley Endowment Fund, in honor of the dean. Premiums on policies taken out on several members will be paid collectively by the seventy-three students who comprise the graduating class. A medal and a symbol of the endowment fund were presented to Father McCauley by the class president, Wallace H. Mathews, at a dinner held at the Shoreham Hotel, May 6.

Texas Society Awards Prizes to Interns

The Tarrant County Medical Society, Fort Worth, Texas, held its annual Interns' Night recently, when winning papers in the annual case report contest for interns in Fort Worth hospitals were presented. Dr. Robert J. Jahn, an intern at Harris Memorial Methodist Hospital, won the first prize of \$15 for a paper on "Traumatic Diaphragmatic Hernia" and Dr. Charles W. Braselton Jr., a resident at Cook Memorial Hospital, the second prize of \$10 for a paper on "Hemachromatosis." Dr. Claude S. McConnell, also at Harris Memorial Methodist Hospital, received honorable mention for a report on "Congenital Hemolytic Jaundice."

Western Reserve's Hamann Society

The membership of the Hamann Society at Western Reserve University School of Medicine, Cleveland, comprises a group of twenty junior and senior students who during the school year present original papers and discuss diagnostic problems, while certain members of the faculty, who are honorary members of the society, act as referees. During the last year the senior members of the society presented reviews on the chemotherapy of pneumonia, peripheral vascular disease, chronic pancreatitis, influenza virus, cancer research, diagnostic value of the spinal fluid and fluid balance in postoperative therapy. The junior members presented historical sketches of men of Cleveland who have made notable advances in medicine. At the final meeting of the society for the year, the officers elected for the next year were Robert Rogoff '42, president; Arthur F. Young Jr. '42, vice president; Robert J. Fulton '42, treasurer and Perry R. Ayres '42, secretary.

Student Saves Fireman's Life

Henry J. Heimlich, a student at Cornell University Medical College, New York, spent the summer as a counselor at a children's camp near Lee, Mass., and was returning home on a special train with 254 children when the train was derailed at Hatch Pond, the first three cars plunging into the water. According to the *New York Times*, after helping the children to the rear cars, student Heimlich found the fireman of the train struggling in the water with one leg pinned in the wreckage and held his head above water for two hours until the fireman was released. The engineer of the train was killed. For his courageous conduct, Heimlich received a gold watch on September 24 from the Greater New York Safety Council. The award was made by the president of the council, Frank L. Jones, in the faculty room of the college at 1300 York Avenue.

Harvard Undergraduate Assembly

The undergraduates of Harvard Medical School, Boston, have an undergraduate assembly which devoted its second annual meeting to reports of investigative work of certain students. As illustrations of these undergraduate studies, the *Harvard Medical Alumni Bulletin* mentions the following: "Thyroid and Parathyroid Hormone Effects on Calcium and Phosphorus Metabolism" by John W. Kirklin '42 and William R. Christensen '42; "Blood Vascular Bundles of Aquatic Mammals" by Don W. Fawcett '42; "The Effect of Thyrotropic Hormone Alone and Combined with Iodine on Thyroid Tissue Metabolism in Vitro" by Willard P. VanderLaan Jr. '42; "Phenylpyruvic Oligophrenia" by Allan D. Callow '42.

History of Medicine Society at Tulane

The History of Medicine Society of Tulane University concluded its year's program with a banquet May 8. The principal address was given by Dr. Edward William Alton Ochsner, New Orleans, on "Contributions of Chicago Physicians to Medicine." Dr. B. Bernard Weinstein of the department of gynecology at Tulane presented the Rudolph Matas Award for the best student contribution to Morton M. Ziskind '42 for his paper entitled "Harvey Cushing." The I. I. Lemann Award was presented to Walter J. Trautman Jr. '43 for his discussion "Albrecht von Haller." The History of Medicine Society Award was presented to Granville I. Walker Jr. '42 for his paper entitled "Hans Zinsser." Walter J. Trautman Jr. was elected president and Dr. B. Bernard Weinstein, faculty adviser.

The William Osler Medal

The American Association of the History of Medicine has established a medal, to be known as the William Osler Medal, which will be awarded annually to the author of the best student essay submitted to the association. Essays that are the results of original research will be given preference, but essays also will be considered which, without being the result of original research, show an unusual appreciation and understanding of historical problems. The association will award the medal for the first time at its eighteenth annual meeting in Atlantic City, N. J., May 3-5, 1942. It will consider unpublished essays that have been written during the academic year 1940-1941 by men or women who at that time were students in schools of medicine and had not yet obtained their doctor's degree. Essays must be sent before Nov. 1, 1941, to the secretary of the American Association of the History of Medicine, Dr. Henry E. Sigerist, Institute of the History of Medicine, 1900 East Monument Street, Baltimore.

Illness Among California Students Last Year

Dr. William G. Donald, university physician, University of California, Berkeley, in his report to the president of the university on medical service rendered students at the E. V. Cowell Memorial Hospital on the campus said that there were 640 students with influenza hospitalized during the last academic year, 523 for other respiratory infections, 104 for appendicitis and 62 for pneumonia. During the year, the number of surgical operations was 503, as against 590 for the previous year.

Junior Colleges to Survey Health Education

The president of the American Association of Junior Colleges, James C. Miller of Columbia, Mo., has appointed a committee to study the need, the programs, courses, staff and other factors related to better health education in the 625 junior colleges in the country. The following committee was appointed: Miss Indie L. Sinclair of Gulf Park College, Gulfport, Miss.; Clarence D. L. Ropp of Junior College of Connecticut, Bridgeport, Conn.; Miss Elsie Elliott of Bennett Junior College, Millbrook, N. Y.; Walter W. Krueger of Grand Rapids Junior College, Grand Rapids, Mich.; Elden B. Sessions of Carbon Junior College, Price, Utah, and Mrs. Josephine K. Adams of Menlo Junior College, Menlo Park, Calif.

The Freshman Class at Louisiana

The freshman class at Louisiana University School of Medicine, New Orleans, this fall comprises ninety-eight students from ten states of this country and from Argentina, Puerto Rico, Santo Domingo and Germany. The average age of the members of the class is 22 years. Six men in the class are sons of physicians. The eleven girls average 5 feet 4 inches (163 cm.) in height and 125 pounds (56.7 Kg.) in weight. Ten different religions are represented in this class.

Yale Graduates Win Prizes and Scholarships

Yale University School of Medicine, New Haven, Conn., announced June 15 the award of the following prizes and scholarships to members of the graduating class:

The Keese Prize, for the most meritorious thesis, to Marvin Blum, B.S. Yale 1937, Wilkes-Barre, Pa.; honorable mention to Robert F. Dine, B.A. Harvard 1937, Allston, Mass., and Peter A. Duncan, B.S. Bates College 1937, Hyde Park, Mass.

The Campbell Gold Medal, for the highest rank in the examinations of the course, to George James, B.A. Columbia 1937, Ridgefield, Conn.; honorable mention to Herbert W. Diefendorf, B.S. Rensselaer Polytechnic Institute 1937, Glens Falls, N. Y., and Robert W. J. Ollayos, B.S. Yale 1938, Hamden, Conn.

The Parker Prize, for the student who has shown the best qualifications for a successful practitioner, to Herbert W. Diefendorf.

The Ramsay Scholarship, for a student of unquestioned ability and character after completing his first year in the Department of Clinical Medicine, to Allan V. N. Goodyer, B.S. Yale 1939, Stamford, Conn.; honorable mention to Maurice Tulin, B.S. Trinity College 1938, Hartford, Conn.

The Perkins Scholarship, for the best record in scholarship in the basic subject of the medical and biologic sciences, to John R. Brobeck, B.S. Wheaton (Ill.) College 1936, M.S. Northwestern 1937, Ph.D. 1939, Steamboat Springs, Colo.; honorable mention to Joseph P. Kriss, B.S. Pennsylvania State College 1939, State College, Pa.

The Ferris Prize in Anatomy, for a student recommended by the Department of Anatomy for the excellence of his work in dissection, to James T. Wolstenholme, B.S. New York University 1940, Clifton, N. J.; honorable mention to Thomas D. Cook, B.A. Lafayette College 1940, Sioux City, Iowa.

Employment Service at Long Island

The Student Employment Service at Long Island College of Medicine, Brooklyn, has been attempting to place students wishing to give their services for a moderate charge or in exchange for room and board during the school year. The following hospitals have accepted students for such remuneration: St. John's, Bayridge, Peck Memorial and the Jewish Home for Chronic Disease.

Portrait of Dr. Sollmann

A portrait of Dr. Torald Sollmann, dean of Western Reserve University School of Medicine, Cleveland, was presented to the school of medicine at the sixty-ninth annual banquet of the Medical Alumni Association, June 3. Mr. Charles Hopkinson of Boston was the artist. Dr. Thomas P. Shupe, Cleveland, is president of the alumni association. At the ninety-eighth annual

commencement of the school of medicine, June 11, the address to the graduating class was delivered by Dr. Louis J. Karnosh, associate clinical professor of nervous diseases. The Hippocratic Oath was read by Dr. Harry Goldblatt, professor of experimental pathology.

Tufts Awards

Ralph M. Myerson '42 received the George F. Keenan award of \$25 from the Tufts Medical Alumni Association and also one year's subscription to the *New England Journal of Medicine* for his paper on "Endometriosis," which appeared in the *Tufts Medical Journal* last March. The winner was chosen after the several papers were read and graded by two members of the faculty; the selection of the one considered best was then made by the editorial board of the *New England Journal of Medicine*. Last year the award was presented to Herbert R. Glodt '41 for his paper "The Diabetic as a Surgical Risk."

Women Students Furnish Study Room

The Women's Club of Western Reserve University School of Medicine, Cleveland, has furnished a study room for the students. Funds for this purpose were raised by holding a social function at the medical school, March 28, which was attended by more than four hundred persons and from which the net receipts amounted to \$560.

Medical Society Collaborates with Continuation School

The Continuation School of Wayne County, Detroit, which opened September 10 at Wayne University College of Medicine and which will continue its classes through June 3, 1942, is a joint effort to provide a training program for practitioners by the Wayne County Medical Society, the College of Medicine, the Detroit Department of Health and the hospitals of Wayne County. Many members of the county medical society have enrolled for bedside examination, clinical conferences, laboratory studies and the courses in anatomy, pathology, physiology and physiologic chemistry. Ten Detroit hospitals are participating in this program.

Harvard Opens New Dental School

The new Harvard School of Dental Medicine was opened September 23 with nine carefully selected students from widely separated parts of the country composing the first year class. The dean of the new Harvard School of Dental Medicine is Dr. Leroy M. S. Miner, who is also a professor of clinical oral surgery. The new school was made possible by an endowment of \$1,500,000, mainly from gifts of the Carnegie, Rockefeller and Markle foundations. The maximum number of students to be accepted under the plan of instruction in any one class is set at fifteen for the present. The Harvard Dental School will continue its present course for three years more, until members of the present second year class are graduated. Dr. Miner said that the opening of the school marks the beginning of an important experiment in American dental education. Students in the new school will be occupied for the majority of five calendar years in a combined course of dentistry and medicine, and at the end of that time successful candidates will receive both the M.D. and the D.M.D. degrees. The student will receive the basic training in medicine required of all physicians without sacrificing the essential training in the restorative and reparative technics of dentistry which are important and it is hoped in addition, the dean said, will be equipped to carry on

further study on the causes of dental disease and its prevention.* In addition to Dr. Charles Sidney Burwell, dean of the faculty of medicine of Harvard Medical School who will be chairman of the committee on instruction of the new dental school, the faculty will comprise thirteen men who now serve the Harvard Dental School and the following three men who have been called from elsewhere to work in the development of a new program: Joseph W. Ferrebee, M.D., associate professor of dental medicine, formerly of the College of Physicians and Surgeons, New York; Martin L. Deakins, D.D.S., formerly of the University of Rochester School of Medicine and Dentistry, Rochester, N. Y., and Charles M. Waldo, D.D.S., assistant professor of orthodontics, formerly of the University of Michigan School of Dentistry, Ann Arbor. Dean Burwell of Harvard Medical School said that the integration of medical education and dental education that is represented by this new course of study is the natural result of a steady trend in teaching in the Harvard Dental School during recent decades.

Films of the Chests of California Students

The University of California at Berkeley will inaugurate this fall a program for the detection of abnormalities of the chest, especially tuberculosis, among its students. A new roentgen apparatus which will take miniature pictures of the chest economically has been ordered in which a fluorescent screen is substituted for the usual roentgen film and a picture is taken of the image on the screen with a small camera. Thus a permanent record may be made which can be used at any subsequent time during the student's career. Dr. Chesley Bush, consultant in diseases of the chest at E. V. Cowell Memorial Hospital in Berkeley, is said to have been responsible for initiating the program, which will be carried out by Drs. Elizabeth S. Heald and James T. Harkness of the Cowell Hospital staff.

Prizes Awarded at Jefferson

The following prizes, among others, were awarded by Jefferson Medical College of Philadelphia at the commencement June 6:

The Henry M. Phillips Prize of \$75. Awarded on the recommendation of the professor of medicine to the graduate, in his opinion most worthy, to Grover Cleveland Powell Jr. '41.

The Henry M. Phillips Prize of \$75. Awarded on the recommendation of the professors of surgery to the graduate, in their opinion most worthy, to Clyde Cornelius Greene Jr., with Honorable Mention of Earl William Schafer Jr. and George Francis Catlett.

Practice Prize. A gold medal awarded by bequest of Dr. Francis W. Shain for the best essay on a subject pertaining to the practice of medicine, to Grover Cleveland Powell Jr.

Surgery Prize. A gold medal awarded by bequest of Dr. Francis W. Shain for the best essay on a subject pertaining to surgery, to John Charles Cressler, with Honorable Mention of Wesley Rhys White and Ralph Monroe Bell.

Gynecology Prize. By Professor Scheffey, \$25 for the best examination and clinical report on gynecology, to Lloyd Ralph Forcey, with Honorable Mention of Frederick Balthus Wagner Jr., Earl William Schafer Jr. and Edwin Homer Tallman.

Otology Prize. By Professor Williams, \$25 for the best examination in otology, to Hubert Horace Washburn, with Honorable Mention of Frederick Alexander Robinson Jr.

Clinical Surgery Prize. A gold medal for general excellence in clinical surgery, in memory of Francis Torrens Stewart, professor of clinical surgery, Jefferson Medical College, 1910-1920, to Oscar Creech Jr., with Honorable Mention of John Charles Cressler and Frederick Balthus Wagner Jr.

Obstetrics Prize. By Professor Vaux, \$25 for the best examination in obstetrics, to Frederick Smith Derr, with Honorable Mention of Rufus Edward Palmer III.

Pediatrics Prize. By Professor Bauer, \$25 for the best examination in pediatrics, to Grover Cleveland Powell Jr., with Honorable Mention of Hubert Horace Washburn and John Charles Cressler.

Ophthalmology Prize. By Professor Shannon, \$25 for the best examination in ophthalmology, to Frederick Balthus Wagner Jr., with Honorable Mention of William Allen Longshore Jr. and Charles Lane Schucker.

Tie in Highest Scholastic Standing at Indiana

Dr. Marcus Ravdin of Evansville, Ind., presented gold keys on May 16 to Jack R. Hall and Lowell L. Henderson of the graduating class of Indiana University School of Medicine, Indianapolis, who tied for the highest general average grade for the four years of study. In former years it was Dr. Ravdin's custom to present a medal to the student having the highest general average.

Fellowship Awarded

The Kirstein Fellowship at Harvard Medical School, Boston, was awarded for the summer to Dr. Israel Kapnick at Providence, R. I., who was studying at the Massachusetts General Hospital, Boston. Dr. Kapnick, a graduate of Brown University received his M.D. degree from Harvard in 1938.

Student Aid Foundation of Michigan

The Student Aid Foundation of Michigan announced September 24 that sixteen persons have been awarded scholarships to Wayne University for the current year. Other collegiate institutions for which students have been awarded scholarships by this foundation include the University of Detroit, University of Michigan and several state owned colleges, as well as twelve colleges and universities outside of Michigan. The Student Aid Foundation of Michigan is a corporation financed by the McGregor Fund.

Wisconsin State Board Questions in Surgery

Following are the questions in surgery used at the June 25, 1941 examination held by the Wisconsin State Board of Medical Examiners:

(Answer eight only and number accordingly)

1. Discuss the management of a middle aged person, picked up in the street in an unconscious condition, with a lacerated wound in the scalp?
2. Discuss diagnosis and treatment of a complete fracture of the middle one third of the clavicle.
3. Outline your choice of treatment of osteomyelitis in long bones.
4. Discuss the advantages of a vaginal hysterectomy in a comparative choice of operation.
5. Give your method of treatment and management of a carbuncle on the back of the neck.
6. Outline your treatment of definite fractures of the hip in elderly people.
7. What is basal anesthesia?
(a) Drugs used and dosage?
(b) How and where administered?
(c) Indications and contraindications?
8. State briefly the etiology, symptoms and treatment of septic peritonitis.
9. What is the heart risk (or danger) in a major surgical operation.

"DO YOU KNOW WHAT PHYSICIAN"

Following are answers to the questions appearing on page 1481:

1. William G. Atherstone (1814-1898), who studied medicine in Dublin and Heidelberg, where he graduated in 1839. He returned to South Africa and took great interest in public affairs. He was also a geologist, botanist, artist and musician and from his researches may be traced the beginning of the great diamond mines of South Africa.

2. Dr. Henry J. Bigelow (1816-1890) of Boston, who graduated from Harvard Medical School in 1841 and on Nov. 18, 1846 published in the *Boston Medical and Surgical Journal* a paper entitled "Insensibility During Surgical Operations, Produced by Inhalation," which was one of the first papers on anesthesia to be published. In 1869 Dr. Bigelow published a book entitled "The Mechanism of Dislocation and Fracture" in which he described the iliofemoral (Y) ligaments.

Book Notices

Applied Pharmacology. By A. J. Clark, M.C., M.D., F.R.C.P., Professor of Materia Medica and Pharmacology in the University of Edinburgh. Seventh edition. Cloth. Price, \$5.50. Pp. 672, with 92 illustrations. Philadelphia: Blakiston Company, 1940.

When most medical writers suffer from comprehensive megalomania, educators would do well to examine this book as a model. Sensible in size, it contains an adequate number of the most important drugs. It has cut down "acreage" to cultivate better a smaller domain. It emphasizes fundamentals and builds a solid foundation. This is good psychology and makes for good pedagogy. The scientific evidence for the therapeutic action of the more important drugs is given. The student often fails to appreciate the connection between pharmacology and therapeutics because he is taught these subjects at different stages of his career. This creates a gap the bridging of which is one of the aims of this book. The author is the successor to a chair held by Fraser and by Cushny. Like them, he appreciates scientific foundations in the study of medicine. He is equally aware that pharmacology in the medical school should be taught with a definite goal in mind, i. e. its application to the practice of medicine. He realizes also that such a goal should not minimize but develop a scientific foundation. An increase in the size of the book has been avoided by deleting material that appears to be no longer of any great importance. Revision of this kind takes courage, but it is the badge of a leader. New chapters have been added describing the action of sulfonamide derivatives and the pharmacology of the hemopoietic system. The subject is presented in thirty-five chapters. General principles, the administration of drugs, vitamins, antelmintics, the action of disinfectants and the actions of radiations are each given a chapter. Chemotherapy is given four chapters. The other chapters are devoted to the various physiologic systems. The space allotted to each seems well distributed. If one's aim is to find fault, it can always be done, but finding fault should be followed by a suggestion for material improvement, and this is a problem in which the author commands respect. The real student will find valuable help in this book. The author says that the limits of the book prevent adequate discussion of preliminary questions of physiology and pathology, but in many cases he has given a short abstract of the most likely explanations of these problems, stating that often such views are of necessity dogmatic and represent only one opinion of controversial subjects. The tone of the book is stimulating. It recognizes that to date only a partial explanation can be given for a few of the simpler effects produced by drugs.

Fluorescent Light and Its Applications Including Location and Properties of Fluorescent Materials . . . A Theoretical and Practical Exposition of Fluorescence and Similar Phenomena. By H. C. Dake and Jack De Ment, Research Chemist, The Mineralogist Laboratories, Portland, Ore. Cloth. Price, \$3. Pp. 256, with 25 illustrations. Brooklyn: Chemical Publishing Company, Inc., 1941.

As indicated by the authors of this book, fluorescent light and its applications represent the work of many minds and many hands extending over an interval of many years. The aim of the authors is to present a summary covering a wide range of applications of fluorescent light to meet the needs of a wide range of readers—professional scientists and those without technical training.

Of the eleven chapters the first four, comprising sixty-nine pages, may be considered introductory. These introductory chapters discuss (1) the historical aspects of luminescence (particularly fluorescence), (2) radiation, the eye and color perception, (3) classification of the various types of luminescence and methods of excitation (thermal, chemical, roentgen ray, frictional) and (4) theories of luminescence (the presence of traces of a material that is an "activator" of the substance).

Recently the public has shown a renewed interest in fluorescence, and the various information services are plect with questions that are answered in the six following chapters of this book: chapter 5 on methods of examination and technic, chapter 6 on sources of ultraviolet radiation (some twenty-eight pages on lamps and filters) to excite fluorescence and chapter 7 (twenty pages) on fluorescent minerals. In this respect the

book is very timely. Chapter 9 (ten pages) is devoted to the luminescence of gems and collections of fluorescent gems, and chapter 10 (ten pages) describes some notable collections of fluorescent minerals, including a description of applications of fluorescent minerals in ornamental construction, e. g. fireplaces.

Chapter 11 (some fifty-five pages), on uses of ultraviolet light, contains information of fluorescence as applied in chemistry and fluorescent lighting. There is a discussion of applications of ultraviolet light (fluorescence) in crime detection, in medicine and in biology. The application of ultraviolet radiation as a germicide would not have received such an enthusiastic endorsement (p. 179) if the writers had considered the fact that a direct hit of ultraviolet rays is required to kill a bacterium and that a finger mark or lipstick grease will shield a germ that may be on the edge of a drinking cup. These digressions on the use of ultraviolet radiation in identification, crime detection and disinfection make interesting reading to the layman, but the expert probably will want to consult more authoritative and comprehensive presentations on the subject.

Several pages are devoted to the use of ultraviolet light in mining and prospecting in detecting minerals by fluorescence. A bibliography of twenty pages gives extensive references to the whole subject.

As a whole this book is interesting and informative, but the last chapter lacks discrimination in selection of material. For example the citation of luminescence of animals (p. 208) is interesting but it is irrelevant. Interjected between two paragraphs on fluorescence, (1) in cutaneous disorders (trichophytosis, ringworm) and (2) in chlorophyll, the reader might infer that the firefly emitted its light by fluorescent excitation by ultraviolet rays. It so happens that the body fluid of the firefly contains a substance that emits a bluish fluorescent light; but the authors do not mention this fact. Moreover there is no recognized connection between the fluorescent substance in the body fluid of this insect and the light emitted by it. Overlooking these minor digressions from the main topic, the book should serve a useful purpose to those seeking enlightenment on fluorescence and its applications.

Clinical and Experimental Investigations on the Genital Functions and Their Hormonal Regulation. By Bernhard Zondek. Cloth. Price, \$4.50. Pp. 264, with 59 illustrations. Baltimore: Williams & Wilkins Company, 1941.

This monograph presents a summary of the clinical and experimental investigations which Zondek has carried out in Jerusalem since 1935. These studies are a continuation of the work done by him in Berlin and deal entirely with the female genital function and the gonadal and gonadotropic hormones connected with this process. At the beginning of the book is a valuable survey of the historical development of sex endocrinology. In it the author refers not only to his own research but also to the valuable contributions of others. The book is divided into six parts: (1) the occurrence of some estrogenic substances in nature, (2) experimental and clinical investigations on the percutaneous use of estrogenic and androgenic hormones, (3) the effect of protracted treatment with high doses of estrogenic hormone, (4) the fate of the sex hormones in the organism, (5) clinical investigations concerning the cycle of the female organism and (6) the mechanism of menstruation.

Zondek still uses the term *prolan* to indicate the chorionic gonadotropic hormone, but most endocrinologists, at least in the United States, have discontinued this term.

Among the author's results may be mentioned the following: The urine of one pregnant mare yields as much estrogen as can be obtained from one thousand five hundred women. Testosterone is more readily absorbed through the skin when it is in alcoholic solution than when in oily solutions. Large doses of estrogen eliminate the somatropic and gonadotropic functions of the anterior pituitary lobe, but the thyrotropic and parathyrotropic hormones are not decreased. Prolonged administration of estrogen produces hyperemia of the myometrium and endometrium, glandular cystic hyperplasia of the endometrium, necrosis of the endometrium and aseptic suppuration of the uterine cavity. Even when doses of estrogen up to 800,000 international units have been used in women, cancer was not observed. Menstruation can be inhibited by giving estrogen, because this hormone blocks the gonadotropic secretion of the

anterior pituitary, thereby interfering with the development of the corpus luteum and progesterone. When gonadotropic hormones are administered with estrogen, ovarian degeneration is prevented. The sex hormones (gonadotropin, estrone and progesterone) are rendered inactive a short time after their administration. In secondary amenorrhea progesterone can induce bleeding, but in primary amenorrhea this hormone alone fails. The loss of ovarian function is characterized by an increased excretion of gonadotropic substance in the urine because of the absence of any inhibitory action of the ovary on the anterior lobe. Insufficient glycogen was found in the secretory endometrium of 18.4 per cent of all cases of sterility. Zondek believes that the young fertilized ovum cannot be embedded if it does not find sufficient glycogen in the uterine mucosa.

This book should be read by every one who is interested in endocrinology and gynecology. It is well written, is abundantly illustrated and has an extensive but selected bibliography.

Schizophrenia in Childhood. By Charles Bradley, M.D., Medical Director, Emma Pendleton Bradley Home, East Providence, Rhode Island. Cloth. Price, \$2.50. Pp. 152. New York: Macmillan Company, 1941.

This small volume has been made possible by the beneficence of the Supreme Council, Thirty-Third Degree Scottish Rite Masons of the Northern Jurisdiction, and it is one of many researches on dementia praecox which they have sponsored.

The evolution of the concepts of dementia praecox and schizophrenia is presented briefly. Kraepelin and Bleuler had in mind definite disease processes, quite in contrast to Adolf Meyer's concept of a person who remains the center of attention and who must be studied in terms of his actions, his work, his accomplishments.

The volume is valuable for its brief review of literature, especially nomenclature used in the past to designate psychoses in childhood. Prior to 1900 the reports of such were meager. Up to 1925 the kraepelinian influence is pointed out and after that date its decline is noted. The incidence of schizophrenia prior to puberty is thought to be rare. Even the prepuberal psychotic episodes in the lives of those destined to have schizophrenia in adulthood are infrequent, as Gray has pointed out. More boys than girls are affected, in the ratio of perhaps 2 or 3 to 1. The earliest age recorded with this diagnosis was $2\frac{1}{2}$ years.

The criteria for making a diagnosis of schizophrenia among adults are not entirely suitable for making it in childhood. The usual adult types (catatonic, hebephrenic) are not usually seen. The chief groupings to be observed are those with acute and chronic onset. The difficulties of differentiation from other disorders, such as mental deficiency or encephalitis, and also unusual behavior in normal children, are discussed.

The chief symptoms essential to the postulation of childhood schizophrenia are "diminished interest in environment, emotional disturbances, regressive symptoms, motor behavior disturbances, speech and thinking disturbances, hallucinations and delusions." It is difficult to decide which symptoms are primary and which ones are secondary. Etiologic factors are unknown. There are no neuropathologic studies which regularly correlate brain disease with these afflictions. Laboratory experiences of other types have not helped in the understanding of such children. The electroencephalogram has revealed suggestive changes. Psychometric tests give evidence of an increased scatter and decline of intelligence quotient. Rorschach tests help by pointing out clues to the changes taking place.

Prognosis is reported to be particularly bad. Treatment thus far has been of little avail. However, shock, drugs and general guidance and care have not received sufficient trial to estimate their real worth.

The author writes with some hesitation about the distinguishing features that make this a unified syndrome. This uncertainty appears to be little more than a reflection of the feeling that so-called schizophrenia in adults constitutes a composite word picture about certain kinds of maladaptations of differing persons—indeed a very vague syndrome as compared with lobar pneumonia. Doubtless more knowledge of all types of pre-adolescent psychoses will be helpful in understanding serious pitfalls in childhood. If, instead of trying to delimit a syndrome, the author had seen its broader relationships to childhood, as for example the deterioration of the imagination (Galton), the

variability in the evolution of language and thinking (Piaget) or the factors that lead to the present concepts of convulsive therapy (Meduna), pubertas praecox and so on he would have placed these disorders of children in a more understandable milieu. Janet has said that hard and fast lines are drawn by men and not by nature.

Physicians and others interested in the disabilities of childhood will find in this volume much thought provoking material.

The Control of the Lead Hazard in the Storage Battery Industry. By Waldemar C. Dreessen, Passed Assistant Surgeon, et al. From the Division of Industrial Hygiene, National Institute of Health. Prepared by Direction of the Surgeon General. Federal Security Agency, U. S. Public Health Service. Public Health Bulletin No. 262. Paper. Price, 30 cents. Pp. 138, with 42 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

This is a study of the health of 766 storage battery workers in six plants and of the diagnostic value of several laboratory tests. The proportion of workers with early plumbism, classified by atmospheric exposure to lead, rises from 4 per cent for men exposed to less than 0.74 mg. of lead in 10 cubic meters of air to 54 per cent for men exposed to more than 3 mg. of lead per 10 cubic meters of air. There are no important time trends. Nine men had a combination of clinical and laboratory signs that warranted a diagnosis of incipient plumbism. No disabling plumbism was seen. Relatively few men complained of ill health, and there was only a small correlation between the frequency of a complaint and the concentration of lead in the atmosphere to which the workers were exposed. Each of the 9 men had a blue or metallic lead line on his gums. Only 2 were underweight. These 2 had the highest proportion of abnormally staining erythrocytes, the lowest red cell counts and the lowest hemoglobin values. In general there is an increase in the value of lead in both blood and urine with an increasing atmospheric concentration of lead. This correlation was not so close that a man's atmospheric exposure to lead could be predicted on the basis of either or both of these values. Persons whose condition is diagnosed early plumbism tend to have higher blood and urinary concentrations of lead than similarly exposed but nonaffected workers. With increased blood and urinary concentration the probability of plumbism increases. The average reticulocyte percentage value and stippled cell count increases with increasing atmospheric concentrations of lead, and it increases with increasing length of employment. Workers exposed to atmospheric concentrations of lead in excess of 3 mg. in 10 cubic meters of air had a significantly lower average erythrocyte count than those exposed to less than 0.4 mg. of lead in 10 cubic meters of air. There was little variation of hemoglobin. Albuminuria was found twice as frequently among lead affected workers as among nonaffected workers. There were no significant increases in cardiovascular disease among exposed workers. It was concluded on the basis of the data presented that it does not seem appropriate to designate certain critical values for blood or urinary concentrations of lead as having diagnostic significance. Equipment and practices found to be effective in reducing exposure to lead are discussed.

Fractures. By George Perkins, M.C., M.Ch., F.R.C.S., Assistant Orthopaedic Surgeon to St. Thomas's Hospital, London. Cloth. Price, \$6.50. Pp. 384, with 401 illustrations. New York & London: Oxford University Press, 1940.

It is customary for an author to include a foreword or preface giving some explanation, often savoring of an apology, for writing the book. There are several untouched leaves in the forepages which might have been used for such a purpose, but the author leaves the reviewer completely in the dark as to just what purpose he had in mind for this book. However, the fact that the author, George Perkins, M.C., M.Ch., Oxon., F.R.C.S., is a member of the staff at St. Thomas's Hospital lends weight to the book.

It is difficult to review the book even though the subject matter is well organized and well presented. The first part is devoted to general consideration of fractures and has much sound teaching in it. Fracture treatment, according to the author, should be divided into four stages: first, reduction; second, fixation until union; third, protection until consolidation; and fourth, although he gives no definite heading for this stage, it might well be called restoration of function.

The book is didactic and individualistic. There is not the least attempt to discuss methods recognized and utilized by others; for example, in discussing the treatment of ununited fractures of the neck of the femur the author does not even mention the bone graft, the Whitman operation and the Brackett operation—all well recognized procedures in the United States—the McMurray osteotomy being the only one mentioned.

Probably the purpose of the book was to put into the hands of Mr. Perkins's undergraduate students a synopsis of his lectures; if so, this end has been adequately attained. However, for the graduate student working toward an advanced degree the book would be entirely too narrow in scope, for there are practically no references made to methods advanced by others who have contributed greatly to the treatment of fractures. Therefore the book cannot be recommended for general use, although valuable and interesting because it represents the practices in vogue at St. Thomas's Hospital in London.

The illustrations are outline pictures and adequately portray what the author wishes to convey. Throughout the book portions of pages are left unfilled, and it may be that these are for additional notes by the author's students. The book contains much valuable information and there is ample evidence in it that the author is a keen clinical observer and that he has had a large experience. The fact that the trying times through which those in the medical profession in London are going did not defer the publication of this book is further evidence that our English confrères are made of stern material. Furthermore, it is well known that the German bombs have well nigh destroyed the stately St. Thomas Hospital. In spite of this the staff carries on, and we in America would do well to salute its members.

Manual of Human Cross Section Anatomy. By Dudley J. Morton, M.D., Associate Professor of Anatomy, College of Physicians and Surgeons, Columbia University, Raymond C. Truex, M.S., Ph.D., Instructor of Anatomy, and Carl E. Kellner, Departmental Artist. Cloth. Price, \$6. Pp. 249, with 90 illustrations. Baltimore: William Wood & Company, 1941.

The manual is a laboratory notebook consisting mainly of outline drawings of cross sections of the adult human body. It is intended that the students will fill in these drawings and label them completely. With each section there is a list of structures for the students to locate. The authors suggest that this manual be used with a series of colored lantern slides which they have also prepared. They point out that the advantage of this manual is that it makes unnecessary the preparation of cross sections for the course and that the students will have a complete book of cross sections labeled by themselves, and better than the few badly soiled drawings which students usually make directly from the adult cross sections in the average cross section anatomy course as it is given in this country. The reviewer, however, does not believe that wax models impressed from actual cross sections, and kodachrome photographs of these wax models, can ever take the place of natural material. Many anatomists feel that, while cross sections are messy for students to handle and are difficult to keep in good condition, the actual cross sections have the advantage that they may be further dissected by the student so that a given artery or nerve, for example, may be traced through the thickness of the section and from section to section. This criticism, moreover, implies that a course in cross section anatomy is of little value to undergraduate medical students who have not yet had any clinical experience. Many surgeons as well as anatomists feel that cross section anatomy is not of much value to the undergraduate medical student.

Annual Report of the Malaria Advisory Board, Federated Malay States, for the Year 1940. By A. Neave Kingsbury, Chairman, Malaria Advisory Board, F. M. S. Paper. Price, \$1; 2s. 4d. Pp. 30. Kuala Lumpur: Federated Malay States Government Press, 1941.

This annual report may be of interest to those active in the prevention and treatment of malaria. The booklet is divided into eighteen sections. Of primary interest are those portions discussing the incidence and control of malaria, and supplies of antimalarial drugs and antilarval preparations. The mortality rate in 49,000 hospitalized cases was 2.2 and the monthly totals of malaria cases showed a similarity of pattern for all the states. Because of wartime conditions the supply of antimalarial

drugs has been threatened and the board has advised building up reserve stocks of quinine and other antimalarial agents. The discussion of this problem pertinently points out that an army moving through malaria infested territory might have to resort to mass prophylaxis. In the discussion on experiments with antilarval preparations it is succinctly suggested that manufacturers, before attempting to market an antimalarial preparation, would do well to realize that they have to compete with an efficient and relatively cheap insecticide—oil. Further, one is reminded that field experiments may reveal that a mixture showing the best antilarval properties is not the same as the optimal one developed in laboratory experiments; and control problems are not necessarily the same in all areas and may differ radically with the vector species and other factors.

Cerebrospinal Fever. By Denis Brinton, D.M., F.R.C.P., Physician in Charge of the Department for Nervous Diseases, St. Mary's Hospital, London. Cloth. Price, \$3. Pp. 163, with illustrations. Baltimore: William Wood & Company, 1941.

In the preface the author states that "pictures have been deliberately avoided except for four photographs of the sulfonamide eruption" and "but the dreary repetition of pictures used in most accounts of cerebrospinal fever during the last twenty-five years has not commended itself." This point of view in respect to the value of illustrations is in harmony with that of other British medical writers. But what is much more important, antiquated expressions concerning the pathway of the organism and the pathology of the disease have been supplanted by modern conceptions. All aspects of the infection, including a brief history, are presented in concise form. Particular attention is given to chemotherapy, a preference for sulfapyridine being shown. Commendation seems to be bestowed on English clinicians for innovations in treatment which they have inaugurated since 1937, the year of the advent of chemotherapy. But approximately three years earlier intrathecal treatment was discarded and spinal fluid drainage as a therapeutic measure abandoned in at least three hospitals in this country. The author's conclusion that serum is no longer required when chemotherapy is properly applied is correct, without doubt. But some of the fatality rates quoted for chemotherapy are no lower than figures attained in this country when patients were treated with serum intravenously but without any intraspinal therapy. Too often insufficient consideration is given to the important part played in recovery by the withholding of intrathecal administration of serum. At the close of the volume, preceding a good index, there are approximately three and one-half pages of valuable references; most of these naturally concern British authors. The unprecedented high incidence of cerebrospinal fever in the British Isles will almost certainly be followed by greater prevalence here. This probability should make the subject specially interesting at this time.

Herzkrankheiten. Band 1: Physiologie, Beurteilung und funktionelle Pathologie des Herzens. Von Prof. Dr. Max Hochrein, Direktor der Medizin. Universitäts-Poliklinik Leipzig. Paper. Price, 17.25 marks. Pp. 480, with 170 illustrations. Dresden & Leipzig: Theodore Steinkopff, 1941.

This book resembles in format the one dealing with coronary disease previously published by the author, except that the topic is diseases of the heart rather than those of its blood vessels. This is the second of a trilogy, the last volume of which is to deal with the therapy in heart disease. It is interesting that, despite the energies devoted to destruction, time and energy seem to be available in Germany to write and publish books for the amelioration of disease.

The author takes occasion to incorporate his own work and his extensive knowledge of the literature which he has accumulated in the course of many years of diligent effort in this field. It contains non-German as well as German literature, with a large representation of recent American work. The bibliography is extensive and representative. This work is modern in that the subject is introduced by a section on the recent extensive advances in the physiology of the heart. This physiologic approach is maintained throughout the monograph. The second section deals with the method of physical examination and history taking, together with the newer instrumental methods by which the diagnosis of heart disorders is enhanced, some of which might be considered of more theoretical than practical benefit in this country. The last section deals with the

pathologic physiology of cardiac failure and the pathology and clinical diagnosis of the various types of heart disease. It also deals with the relation of the heart to other disorders of the body. As might be expected with the present interest in Germany, in the closing chapters of the book the relation of the heart to exercise and trauma are stressed. In the last chapter the relation of the heart to age is developed.

The reader will find this volume of considerable importance, particularly in obtaining the point of view of one of the best of the more modern German cardiologists. It is to be recommended more as a source of information than as a systematic textbook for immediate practical use. On that account it is primarily of value to the specialist in heart disease rather than to the general practitioner.

Clinical Aspects of the Electrocardiogram Including the Cardiac Arrhythmias. By Harold E. B. Pardee, M.D., Assistant Professor of Clinical Medicine, Cornell University Medical College, New York. Fourth edition. Cloth. Price, \$5.75. Pp. 434, with 219 illustrations. New York & London: Paul B. Hoeber, Inc., 1941.

After eight years many will welcome another edition of this book, which first appeared in 1924. Terse presentation and a more lucid style would aid the beginner in assimilating the valuable material presented. The text abounds with references to illustrations. Were these more abundant and properly distributed with pagination indicated, frequent search for them, often extending over many pages, would be eliminated and much of the reader's time conserved. Approximately half of the illustrations appeared in the first edition. Legends have been modernized where necessary. Of the remainder, eighteen deal with various chest leads, five of these being concerned with anterior and posterior infarctions. The author describes the numerous varieties of chest leads and recommends that four (EF_2 , EF_3 , IVF and CF_2) be routinely employed, an additional chest lead (CF_4) being used in the presence of cardiac enlargement. This choice does not represent the consensus. The number recommended is not practical for routine clinical use. Justification for two new chest leads, from the level of the ensiform, based on orthodiographic studies with the patient in the erect position, is yet to be demonstrated. A mathematical discussion of vector analysis and Einthoven's triangle occupies almost sixty pages. The author's views regarding nomenclature are virtually as they appeared in the original article. A chapter of thirty-six pages is devoted to the description and operation of the electrocardiograph, the discussion, in part, being complicated by reference to illustrations of an obsolete model which appeared in the first edition. Nevertheless the book affords much valuable information. Opinions at variance with majority views are relatively few. Variations from standard terminology are minor. In spite of the excellent quality of some recent contributions, this remains one of the best.

Lymphatics, Lymph, and Lymphoid Tissue: Their Physiological and Clinical Significance. By Cecil Kent Drinker, M.D., D.Sc., Professor of Physiology, School of Public Health, Harvard University, Boston, and Joseph Mendel Yoffey, M.Sc., M.D., F.R.C.S., Senior Lecturer in Anatomy, University College of South Wales and Monmouthshire, Cardiff, Wales. Cloth. Price, \$4. Pp. 406, with 50 illustrations. Cambridge: Harvard University Press; London: Oxford University Press, 1941.

The primary purpose of this book is to present the physiologic and clinical significance of the lymphatic system in animals; accordingly, the authors have attempted to discuss the relation of the lymphatic apparatus to animal function. In addition to a fairly complete bibliography and the well arranged and thorough author and subject indexes, the contents include nine chapters devoted to anatomic and physiologic organization of the lymphatic apparatus, permeability of blood capillaries and its relation to lymph formation, permeability of lymphatics, lymph flow and lymph pressure, chemical composition and physical characteristics of lymph, biologic significance of lymphoid tissue, cell content of lymph, the lymphocyte and practical considerations.

This volume represents a wealth of material on the physiology of the lymphatic system and should serve as an authoritative source of information. While the book, in general, may appeal only to the laboratory or clinical investigator, the section entitled *Practical Considerations* will interest all members of the medical profession as it discusses items such as circulatory edema, edema due to hypoproteinemia, hypertension, anaphylactic shock, acute

inflammation, relation of the lymphatic system to blood infections, surgical shock, effect of anesthetics and therapeutic increase in lymph flow. Not all readers will agree with the authors in some of their interpretations, but this can be expected where there are as many controversial problems as in the physiology of the lymphatic system. However, the authors state that they are provided with a certain degree of assurance in passing their opinions because they have been able to utilize a large number of the facts uncovered in their laboratory. Further, the authors have extensively consulted the communications of many other investigators.

Problems of Psychoanalytic Technique. By Otto Fenichel. Translated by David Brunswick. Paper. Price, \$1.50. Pp. 130. Albany: Psychoanalytic Quarterly, Inc., 1941.

This volume was published in serial form in the *Psychoanalytic Quarterly* during 1940 by a former German psychoanalyst. The work was originally written in German and subsequently translated into English. The author has been the "textbook writer" of psychoanalysis during the last decade and apparently has adopted the role of interpreter of Freud. He has gathered together data concerning several technical problems and presents the material in easily understandable form, usually adhering to general principles. The book is authoritative and generally valuable, but the student should be cautioned against expecting to learn technic from this or any other textbook. Only from much personal experience is this possible.

Aids to Anatomy (Pocket Anatomy). By Edward P. Stibbe, F.R.C.S., Professor of Anatomy, University of London, King's College, London. Tenth edition. Cloth. Price, \$1.50. Pp. 369, with 50 illustrations. Baltimore: Williams & Wilkins Company, 1940.

This little pocket anatomy is one of the Students' Aids Series. It is only $\frac{5}{8}$ inch thick and 4 inches across. It is essentially a tabulation intended for a review of anatomy by surgeons who have in prospect the surgical examinations. As such it can be highly recommended despite a little carelessness in diction, as for example on page 12, where "opening the jaw" must mean opening the mouth. The fact that this is the tenth edition is evidence of its popularity.

The Biologic Fundamentals of Radiation Therapy: A Textbook. By Friedrich Ellinger, M.D., Research Fellow, Radiotherapy Department, Montefiore Hospital, New York. With a preface by Maurice Lenz, M.D., Associate Clinical Professor of Radiology, Columbia University, New York. English translation by Reuben Gross, M.D., 1st Lieut. M. C., U. S. Army. Cloth. Price, \$5. Pp. 360, with 79 illustrations. New York: Elsevier Publishing Company, Inc.; Distributors: Nordeman Publishing Company, Inc., 1941.

This is the American edition of the book published in Berlin in 1935. It is divided into five parts, the first part being devoted to the action of roentgen rays and radium rays on different tissues, the second part to the action of the corpuscular rays, the third part to the action of ultraviolet rays, the fourth part to the action of visible light and the fifth part to general radiation biology and therapy.

For any one such as an internist, surgeon or radiologist who wants to have available a brief textbook on the biologic action of different radiations, together with an extensive bibliography of the subject, this is the book. However, for those who want more detailed information this work would be rather too brief. Therefore for radiologists who really want to know how rays act on certain tissues a definite and satisfactory answer would probably not be found. The analyses and opinions expressed are, on the whole, sound, although here and there an exception might be taken to certain statements.

A Primer for Diabetic Patients: An Outline of Treatment for Diabetes with Diet, Insulin and Protamine-Zinc Insulin Including Directions and Charts for the Use of Physicians in Planning Diet Prescriptions. By Russell M. Wilder, M.D., Ph.D., F.A.C.P., Professor and Chief of the Department of Medicine of the Mayo Foundation, University of Minnesota, Minneapolis. Seventh edition. Cloth. Price, \$1.75. Pp. 184, with 5 illustrations. Philadelphia & London: W. B. Saunders Company, 1941.

This edition of Dr. Wilder's diabetic primer brings the treatment of diabetes mellitus, as carried out in the Mayo Clinic, up to date. It is clear and concise and a good book for any diabetic patient or any doctor. All physicians who believe in the orthodox treatment of diabetes will find it helpful and can safely supplement the instruction of their patients with it.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TECHNIC OF BLOOD TRANSFUSION

To the Editor:—Difficulties in the way of the clotting of blood have developed in the process of obtaining blood for use in transfusions. My associates and I are using 10 cc. of a physiologic solution of sodium citrate for each hundred cubic centimeters of blood. Some of the men start out by taking about 25 cc. of the citrate solution and using it to citrate the tubing and the bottle and then collect 500 cc. of blood and add 25 cc. of the citrate solution after finishing the collection of blood. Others put all 50 cc. of the solution in at the start. Some of the men whirl the bottle occasionally while the blood is flowing, and some actively agitate it while others do not move the bottle at all. All are successful in collecting blood without the formation of clots; that is, in the majority of cases. They all also get into trouble at times. As chairman of the intravenous committee of the staff, I have been advised to develop a "fool proof" technic. Up to the present I have been advising each man to use that technic which he had been using with success. Should more citrate solution be used? Should the blood be whirled and, if so, how violently? Aren't there individual differences in blood which no technic will completely cover? Is there any physiologic objection to a "cocktail" for the donor following the taking of blood? We are using the Abbott apparatus.

Robert J. Nevin, M.D., Washington, Pa.

ANSWER:—The use of "10 cc. of a physiologic solution of sodium citrate for each hundred cubic centimeters of blood" should be adequate to prevent clotting when collecting blood for transfusion. However, one must be careful to prepare the physiologic or isotonic sodium citrate solution properly. In terms of sodium citrate such a solution contains slightly less than 3 Gm. of the salt per hundred cubic centimeters of distilled water. However, the salts usually employed for the preparation of the solution contain a certain amount of water of crystallization. The official salt of the U. S. P. XI contains two molecules of water, and a 3.2 per cent solution of this salt would be isotonic. The more commonly used salt, however, contains five and one-half molecules of water of crystallization and here the isotonic solution has a concentration of 3.8 per cent. If the last named salt is used in less than a 3 per cent concentration according to the calculation in terms of the sodium citrate proper, one would be working with a narrow margin of safety, and clotting might occur from time to time.

It is preferable to place the entire 50 cc. of solution into the bottle before collecting the 500 cc. of blood rather than to place only 25 cc. of citrate solution into the bottle and the remainder after the blood has been collected. Where there is difficulty in collecting the blood and the blood flows slowly, it is possible for clotting to occur if there is not enough citrate present to take care of all the calcium. However, if the blood is collected with reasonable speed, either procedure would be successful. The use of part of the citrate solution for flushing the tubing as mentioned in the query may prove helpful.

Violent agitation or stirring of the blood is unnecessary and undesirable, because this may result in damage to the red cells and platelets and in this way give rise to transfusion reactions. It is sufficient to whirl the bottle gently occasionally (about every fifteen to thirty seconds) while the blood is flowing to insure thorough mixing of the blood and citrate. The other alternative mentioned, namely not to move the bottle at all, is decidedly risky, since under these conditions thorough mixing of the blood and citrate would not occur. Incidentally, the thorough mixing of the blood and citrate is facilitated by the use of an oversized container, e. g. a quart bottle for collecting a pint of blood. When the disparity between the size of the container and the amount of blood is small, continuous shaking for one or two minutes after the total amount of blood has been collected is advisable to insure proper citration of the blood.

Present evidence suggests little possibility of individual differences in the blood itself which would interfere with the anticoagulant action of sodium citrate when the procedure is carefully carried out. There are, however, individuals with low blood pressure and a tendency to faint readily from whom there may be difficulty in obtaining a free flow. Under such circumstances clotting may be unavoidable at times. By appropriate measures to combat this tendency to faint, and by avoiding the use of donors with blood pressures under 110 systolic, such difficulties can be avoided.

No harmful effects have been observed following the consumption of a "cocktail" by the donor after withdrawal of his blood. In fact, this is almost a routine procedure in many institutions.

More complete information can be obtained from the numerous recent publications on the subject which are listed in the *Quarterly Cumulative Index Medicus*.

TESTING FOR PENTOBARBITAL AND AMPHETAMINE

To the Editor:—A patient frequently appears under the influence of drugs, is confused, unsteady, at times difficult to rouse, shaky when roused, at times with nystagmus, and at times is said to have convulsions, always during the day. It is suspected that the patient takes considerable pentobarbital sodium frequently and at other times amphetamine. Thorough medical, neurologic and laboratory work-ups have revealed only normal data. Can you tell me any laboratory method or test for barbiturates and for amphetamine which are not extremely intricate or elaborate and which may be done in a hospital laboratory without extensive facilities? The patient denies use of drug.

M.D., Massachusetts.

ANSWER:—There is no simple yet specific laboratory method for detecting either pentobarbital or amphetamine in the blood or urine.

Pentobarbital is generally identified by a modification of the technic developed by Koppanyi and his co-workers. This is based on the development of a reddish violet with the cobalt ion in a chloroform solution. It is supposed to be due to reaction with the malonylurea (barbituric acid) ring and it is therefore given by all the barbituric acid derivatives alike. Since pentobarbital is one of the barbiturates which is destroyed in the body, testing the urine seems inadvisable (although some color develops nonetheless). The test must be performed soon after administration of the drug because the blood concentration falls quickly. Delmonico (*Proc. Staff Meet., Mayo Clin.* 14:109 [Feb. 15] 1939) found that pentobarbital is precipitated by tungstic acid, and he modified the test for use directly on whole blood. His method, which is quantitative, can be adapted for qualitative use and as such is probably the simplest and best test available.

From 25 to 50 cc. of oxalated whole blood is extracted with five volumes of chloroform. The addition of reagent calcium sulfate (plaster of paris) to the blood facilitates the extraction. The chloroform extract is shaken with acid-washed charcoal and filtered to remove any color. The chloroform is then evaporated down to 2 cc. on a steam bath. To this, in a test tube, are added 0.6 cc. of isopropylamine reagent and 0.1 cc. of cobaltous acetate reagent. Each of these solutions is made up in absolute methyl alcohol, 5 per cent for isopropylamine and 1 per cent for cobaltous acetate. The reaction develops a reddish violet, which gradually fades. About 85 per cent of the pentobarbital is recovered by this method, which can be made roughly quantitative by comparing the unknown with a known concentration of pentobarbital in chloroform solution.

If one of the longer acting barbiturates is suspected in this case, Delmonico's modification for urine should be tried. Acidify 25 cc. of urine with 10 per cent sulfuric acid and shake for a few minutes with an equal volume of chloroform. Separate, decolorize the chloroform solution by filtration through charcoal, concentrate over a water bath to 5 cc., and develop the characteristic reddish violet with Koppanyi's reagents as described.

Amphetamine can be determined in the urine by a color technic (Beyer, K. H., and Skinner, J. T.: *J. Pharmacol. & Exper. Therap.* 68:419 [April] 1940) but the method is highly involved. Other organic compounds in the urine must first be removed by magnesium oxide, and then a color is developed with paranitrobenzenediazonium chloride. Since the drug is but slowly excreted—less than half in forty-eight hours—the urine at any time during that interval can be tested. The method is complex and calls for meticulous performance. Since it has here been adapted from a quantitative method, some experimental juggling may be necessary. Three samples should be run in parallel fashion, 100 cc. of each, one sample of the unknown urine, a second sample of amphetamine-free urine to which has been added 0.4 mg. of amphetamine sulfate for comparison and a third sample of amphetamine-free urine to serve as a blank.

Each urine is shaken on a mechanical shaker for one hour with 0.8 Gm. (0.2 Gm. per 25 cc.) of coarse magnesium oxide. It is essential that the magnesium oxide be so coarse that a suspension in water filters clear through two thicknesses of good filter paper. After shaking, 8 cc. of 10 per cent sodium hydroxide (2 cc. for each 25 cc. of urine) is added, and the solution is filtered. The filtrate contains about 80 per cent of the amphetamine freed from the other organic compounds in the urine. An aliquot portion of 25 or 50 cc. (depending on the concentration of drug) is extracted of its amine with three

successive portions of equal parts of purified petroleum benzin and toluene, shaken before separation for five minutes each. The amine is in turn extracted from the combined petroleum benzin-toluene fractions by three 10 cc. portions of 0.5 per cent hydrochloric acid. The combined aqueous solutions are evaporated to dryness on a steam bath under a hood, and the residue is taken up in 2 cc. of distilled water. To this is then added the diazonium compound which has been previously prepared as follows:

A stock solution of paranitroaniline is required, prepared earlier by adding 3 cc. of concentrated hydrochloric acid to 0.69 Gm. of paranitroaniline and then diluting to 100 cc. with water. Another stock solution contains 0.7 per cent of sodium nitrite made fresh weekly and stored in the refrigerator. Into a 100 cc. volumetric flask submerged in an ice bath are placed 5 cc. of supernatant nitroaniline solution and 1 cc. of concentrated hydrochloric acid. After standing in the ice bath for ten minutes, 3 cc. of sodium nitrite solution is added, and after six minutes more in the ice bath the solution is diluted with water to 100 cc. It is now allowed to stand for two hours in a refrigerator as close to zero as possible before using. The solution now contains the paranitrobenzenediazonium chloride which must be used within eighteen hours.

To the 2 cc. of aqueous urine extract is added 5 cc. of cold diazonium solution, and the mixture is allowed to stand for one hour at room temperature. Now 5 cc. of 1.1 per cent sodium carbonate is added and the solution allowed to stand for another fifteen minutes. At the end of this time 1 cc. of 10 per cent sodium hydroxide is added to develop the color. This is put aside for ten more minutes before diluting to 50 cc. The color difference of the solutions may now be sufficient to detect the presence of amphetamine; but if not, the colored compound can be extracted with 15 cc. of normal butanol and the comparison made. Addition of a pinch of salt facilitates separation of the two layers.

PERSISTING SINUS OF BUTTOCKS

To the Editor:—A man aged 43 was operated on for a carbuncle in the buttocks four years ago. After three months the incised area was apparently healed. Later a sinus developed at the site of the operation. Despite treatment with silver nitrate, phenol, allantoin, metaphen and other substances the sinus did not heal. I reoperated, incising the sinus and old scar tissue, curetted the tract and phenolized. After two months the area granulated in, but again a sinus formed at the same site. I have since used sodium morrhuate, sulfanilamide, red wash, Peruvian balsam and bismuth but failed to obtain healing. The sinus goes through an area of the buttock. It does not discharge but is moist. The blood Wassermann reaction is negative and the blood chemistry is normal. The basal metabolic rate is plus 5. Urinalysis is negative. Can you tell me what medical applications may be effective or what therapeutic measures should be followed to bring about healing of the sinus?

M.D., New York.

ANSWER.—The persistence of any sinus tract generally implies that the site of origin has not been adequately treated. Most sinuses are the result of a foreign body such as dead tissue as in sequestration of bone in chronic tuberculous or nontuberculous osteomyelitis, or exogenous foreign material or the presence of a large dead space. Often, however, a sinus tract may be confused with a fistulous tract, the latter communicating possibly with the rectum through only a narrow opening. The possibility of a fungous infection should not be overlooked. In any case before adequate therapy can be instituted the nature, course and extent of the sinus must be understood.

From the history and course there are several features in this case of which no mention is made. It would be desirable to know whether the abscess as originally observed and incised was "sterile" as in tuberculosis or whether it possessed pyogenic material. Second, considerable aid in the diagnosis might be obtained by determining the course of the tract preferably by injection with a radiopaque substance, following its course by fluoroscopic examination. A roentgenogram of the pelvic bones and lower part of the spine would be of value in the event that osteomyelitis is the causative agent. A biopsy of the sinus tract might be of value, though frequently the lining consists only of granulation tissue surrounded by polymorphonuclear and round cells. However, if the sinus is tuberculous in origin foreign body giant cells may be observed.

Treatment of such a condition is obviously dependent on the removal of its cause; local treatment of the tract per se is of no consequence. For the surgical management of tuberculous osteomyelitis Steindler's "Orthopedic Operations" (Springfield, Ill., Charles C. Thomas, 1940) can be recommended. If dead tissue or exogenous foreign bodies are observed, healing of the sinus will probably follow the removal of either, the cavity being packed with gauze to promote healing from its depths. If, on the other hand, the tract proves fistulous, communicating with the rectum or anus, treatment should be designed accordingly.

Local therapy, such as the local implantation of the sulfonamides, is of value only as some degree of retardation of bacterial growth is accomplished. The use of the caustics and sclerosing agents affords little hope in the treatment of such a sinus.

MARRIAGE AND DIABETES

To the Editor:—A woman aged 24 became engaged to a diabetic man aged 28. From the history it seems that the man has had diabetes since 1937. The woman has asked me about the advisability of this marriage. Her fiancé takes 20 units of protamine zinc insulin and eats between 2,000 and 3,000 calories daily. He seems to be fairly well but frequently gets weak spells and does not seem to have an awful lot of pep. He also wears glasses. I enumerated to her some of the possible complications of this illness, such as the predisposition of the offspring to diabetes, possible lowered sexual potency of her fiancé and also to the fact that he will have to take insulin continuously and be careful of his food and mode of living. I told her of his extreme predisposition toward infections and occupational accidents and the reduced longevity. An aunt of the woman also has diabetes. What is the proper attitude to take with regard to advising marriage with young persons with diabetes?

M.D., Missouri.

ANSWER.—Certainly there is a strong hereditary factor in the development of diabetes mellitus. This has received much discussion in books written on the subject of diabetes such as those by Joslin and Wilder. It is known that diabetes is much more frequent among members of certain races, such as Hindus and Jews; this is due presumably to generations of intermarriage. In probably about 25 per cent of cases in which diabetes mellitus develops a family history of the disease is obtained. The occurrence of diabetes mellitus in twins has been discussed by Pinkus and White. They found that both twins contract diabetes in 70 per cent of sixteen series of similar twins as compared with only 10 per cent of a series of dissimilar twins. It has been proved that diabetes constitutes a recessive character according to the mendelian pattern. This means that if diabetes were to be eliminated by eugenics not only diabetic patients but all relatives of diabetic patients would have to be sterilized or prevented from marrying. Joslin estimated that it would be necessary to sterilize or prevent the marriage of one citizen out of every four in the United States.

Since the woman in question has a family history of diabetes and since her fiancé has the disease now, there is an excellent chance that one or more of their children or their grandchildren would have the disease. Although it is true that the fiancé will have to live a disciplined life as far as diet and insulin are concerned, it cannot be categorically asserted that "he will have a predisposition toward infections, occupational accidents, reduced longevity or low sexual potency." The probabilities are that he will lead an entirely normal life and have a nearly normal life expectancy.

In conclusion, if this man and woman decide to marry anyway, it will be up to them to decide whether they care to perpetuate the disease in their descendants.

References:

- Joslin, Elliott P.: The Treatment of Diabetes Mellitus, Philadelphia, Lea & Febiger, 1935.
Wilder, Russell M.: Clinical Diabetes Mellitus and Hyperinsulinism, Philadelphia, W. B. Saunders Company, 1940.
Pinkus, Gregory, and White, Priscilla: On the Inheritance of Diabetes Mellitus: I. An Analysis of 675 Family Histories, *Am. J. M. Sc.* 186:1 (July) 1933.

INTRAMUSCULAR THERAPY FOR PREGNANT WOMAN WITH SYPHILIS

To the Editor:—A patient two months pregnant with a Wassermann reaction of 10+ is unable to receive intravenous therapy because no suitable veins are available. Is intramuscular arsenical therapy equally efficacious? What arsenic preparations would you advise for intramuscular injection? What method of therapy is indicated?

M.D., New York.

ANSWER.—There are no data as to the relative value of the intravenous versus the intramuscular administration of trivalent arsenicals to pregnant syphilitic women as far as protection of the fetus is concerned. It is highly probable, however, that with adequate intramuscular medication treatment begun at so early a stage of pregnancy as two months will protect the fetus.

Two arsenical drugs may be given by the intramuscular route—sulfarsphenamine and bismarsen. The former is largely used in the treatment of infantile congenital syphilis. It has been almost completely abandoned for adults because of the high incidence of grave reactions. Since certain of the grave reactions associated with arsenical therapy are more common in pregnant women than in nonpregnant women or in men, sulfarsphenamine should be avoided in pregnancy.

Bismarsen, however, may be used. It may be given twice weekly in doses of 0.2 Gm. each, alternate buttocks being employed for injection. The total number of injections in a

course is usually twenty. Since approximately twenty eight weeks are available for treatment of the patient before delivery, she may be started immediately on a course of twenty intramuscular injections of 0.2 Gm each of bismarsen, this to be followed immediately by eight weekly intramuscular injections of bismuth subsalicylate in oil, each 0.2 Gm, and this in turn to be followed until delivery with biweekly injections of bismarsen.

The type and the amount of treatment to be given after the termination of the pregnancy cannot be outlined without much more complete knowledge of the mother's situation. If the mother's spinal fluid has not yet been examined, this may be conveniently done while she is in the hospital during the puerperium.

VITAMINS AND DEAFNESS

To the Editor—Is Dr Grant Selfridge's method of treating deafness with nicotinic acid in wide use today? What new developments, if any have appeared since publication of his early report?

Henry R Tatem Jr, M D, Audubon N J

ANSWER—Since publication of the article entitled "Nicotinic Acid and the Eighth Nerve. A Preliminary Report (*Ann Otol, Rhin & Laryng* 48:39 [March] 1939), Dr Selfridge has published further articles on related topics (The Eighth Nerve in Relation to Thiamine Chloride and Nicotinic Acid, *ibid* 48:419 [June], Eighth Nerve High Tone Deafness From a Nutritional Standpoint, *ibid* 48:608 [Sept] 1939, A Survey of the Relation Between Nutrition and the Ear, *ibid* 49:674 [Sept] 1940). He came to the conclusion that the nicotinic acid in the vitamin B complex was probably of more value than thiamine in eighth nerve types of hearing difficulty. Other authors (Adam, James Meniere's Syndrome and Avitaminosis, *J Laryng & Otol* 54:256 [May] 1939, Mellanby, Edward The Experimental Production of Deafness in Young Animals by Diet, *Laryngoscope* 49:1090 [Nov] 1939, Veasey, Clarence A Jr Nature of Vitamin B and Its Components with Special Reference to Nerve Deafness, *Arch Otolaryng* 31:74 [Jan] 1940) have contributed during the last year or so.

It is difficult to say how widely Dr Selfridge's method of treatment is used, nor can any one say with a great deal of assurance how much improvement is to be had by treating so called nerve deafness with vitamin products. Shambaugh for example (Chronic Progressive Deafness Including Otosclerosis and Diseases of the Inner Ear, *Arch Otolaryng* 33:436 [March] 1941), says "The strongest argument against the theory that vitamins are important in nerve deafness is the fact that deafness is not a symptom of clinical avitaminosis, neither scurvy, beriberi nor pellagra has been shown to be associated with nerve deafness. If marked clinical avitaminosis does not injure the eighth nerve, it is difficult to believe that mild subclinical avitaminosis would be a cause of nerve deafness. While not convinced that vitamins are a factor in nerve deafness, I have attempted to maintain an open mind and have employed them in numerous cases of nerve deafness, with uniformly negative results to date."

Others besides Shambaugh are equally skeptical. On the other hand, it is clear that when a new remedy is advocated for a hitherto incurable disease it should within the limits of safety receive the widest trial possible with sufficient time, of course, allowed to pass before rendering final judgment.

BLOOD UREA DETERMINATION

To the Editor—I have used the so-called Myers method of determining blood urea, in which the blood protein is precipitated with trichloroacetic acid and the filtrate titrated with mercury bichloride. The end point is determined by adding a drop of the mixture of a saturated solution of sodium carbonate to obtain a brown precipitate (mercuric carbonate?). The calculation of the result involves subtracting a factor which must be determined for each new batch of reagents by performing a few tests on supposedly normal blood. I should like to put this test on a rational basis both chemically and mathematically. Please tell me of the reaction involved, as well as the solubility products and ionization constants of the compounds involved. I am familiar with theoretical chemistry and the principles of inorganic quantitative analysis.

E K Doak, M D, Taylor, Texas

ANSWER—The method the inquirer has been using for the determination of blood urea is apparently the one described by P S Hench and Martha Aldrich (Urea Retention, *Arch Int Med* 38:474 [Oct] 1926). The same authors (The Concentration of Urea in Saliva, *THE JOURNAL*, Oct 21, 1922 p 1409) earlier employed this method to estimate the urea in saliva. This method is an adaptation of the method originally described by von Liebig (*Ann d Chem* 85:289, 853) and used in modified form by Pflüger (*Arch f d ges Physiol* 21:248 1880).

It is obvious that the mercury bichloride solution used in titrating the filtrate obtained after precipitating the blood proteins with trichloroacetic acid will combine chemically with various nitrogenous substances present in this filtrate. Hench and Aldrich were able to show that there was a direct parallelism between the so-called mercury combining power of the blood and the level of the blood urea determined by the urease method. They further noted that, if 60 was deducted from the number of cubic centimeters of 5 per cent mercury bichloride required to titrate the equivalent of 100 cc of blood, it would give approximately the number of milligrams of urea in 100 cc of blood.

While the "mercury combining power of the blood" probably does roughly parallel the urea and nonprotein nitrogen of the blood, as Hench and Aldrich have shown, it is chemically unsound to try to calculate the blood urea with the aid of an empirical factor which at best is only an approximation. The creatinine, creatine, uric acid and amino acids in the filtrate are not constant and would vary as well as the urea, and all would combine with the mercury bichloride. This mercury combining power of the trichloroacetic acid blood filtrate apparently serves as a reasonably good index of the degree of nitrogen retention but cannot be considered a reliable procedure of determining urea. For the determination of urea, the urease method in some form should be used.

VISUALIZATION OF INTRAHEPATIC LESIONS WITH THORIUM DIOXIDE

To the Editor—A patient has a pain in the right upper quadrant with a healed peptic ulcer, and I suspect an intrahepatic cyst or abscess. The roentgen ray man is rather dubious about trying thorotrast. What is the present status of liver visualization with thorium? This patient has been driven to drugs with pain, and I hesitate to explore a liver without some positive indication.

A L Lieberman, M D, Gary, Ind

ANSWER—It is usually possible to visualize an intrahepatic cyst or abscess by the use of a preparation of thorium dioxide. Twenty-five cc of the solution should be injected slowly by the intravenous route on three successive days, and roentgenogram made of the liver and spleen twenty four hours after the last injection. The Bucky diaphragm should be used and roentgenograms taken in the anteroposterior and oblique positions. Cysts or abscesses appear as "filling defects", they have a more symmetrical appearance and sharper margins than metastatic tumors, which also appear as defects in the homogeneous shadow of the liver (Yater, W M and Ottel, L S Hepatosplenography with Thorium Dioxide Sol, *THE JOURNAL*, Aug 12, 1933, p 507).

After injection thorium dioxide remains permanently in the liver. Since it is a radioactive substance and since it may be converted into the even more radioactive substances mesothorium and radiothorium, there is probably some danger connected with its use. Most investigators advise that the material be employed only in cases in which there is some serious reason for using it or in those in which early death may reasonably be expected. In the case in question, it would seem justifiable to employ this method of visualizing an intrahepatic lesion.

RECURRENT PNEUMOCOCCIC MENINGITIS

To the Editor—Is there any treatment or procedure for recurrent pneumococcal meningitis? I have a patient who has had it three times with intervals of four or five months between the recurrences. Sulfapyridine is effective during the recurrences but it cannot be used continuously.

E W Westland, M D, Oak Park, Ill

ANSWER—Recurrent pneumococcal meningitis is one of the best examples of the result of focal infection in the strict sense of the term. It is most likely that there exists a constant source of supply of pneumococci which at times become invasive and penetrate the closed cerebrospinal system when conditions permit. Just what these conditions are is unknown but they are designated generally as either diminished local resistance, diminished general resistance or both. Since pneumococci, particularly those of type III and other higher numbered types, are commonly carried in the nose and throat of even healthy persons, these are the chief sources. This being the case, it should first be determined what type of pneumococcus is the cause in the case mentioned and whether the recurrent attacks are each caused by pneumococci of the same type. Then a search should be made by an otolaryngologist for a possible localized area of chronic infection in certain special areas such as the paranasal sinuses or the mastoid cells. Localized infection, if definitely found, should be treated with appropriate conservative measures. In some cases there seems to be no single or definite source, pneumococci reside as saprophytes over a diffuse area in which case no operative treatment is necessary.

It is also possible that the patient is not a carrier but contracts repeated infections from contact with a person who is a carrier, perhaps another member of the family. In this case, cultures of the nose and throat should be made of all immediate contacts to determine the source of infection and appropriate isolation established if necessary.

At present successful means of treatment have not been devised to rid carriers of pneumococci. Solutions of certain sulfonamide derivatives may be sprayed into the nose and throat as an experimental method, but it is impossible to reach all areas or to penetrate the deep crypts of the mucous membrane where bacteria reside. Type specific vaccine would seem to be indicated to build up specific resistance, but if the spontaneous recurrent attacks of infection fail to do it, as seems to have been the case, it is hard to see how vaccine can do any better. Improvement in the patient's general physical condition with diet, exercise, rest and perhaps a change to an equable climate is recommended.

TIRED EYES WITH SWOLLEN LIDS

To the Editor.—A white woman aged 50, unmarried, occupied as a copy-reader, has experienced aching of the eyes several times a day for over a year. She "feels as though there is no room in the socket for the eyes." This is relieved by cold compresses. Most annoying is the fact that on awakening every morning, without fail, the eyelids and adjacent parts of the face and forehead are notably swollen, so that it is only with difficulty that the lids can be opened, when the eyes have been washed with boric acid solution or plain warm water the swelling subsides and does not recur all day. There is a small amount of yellowish exudate in the inner canthus in the morning before the eyes are washed. Sometimes this swelling awakens her at night. A Gram stain on the exudate showed a few gram-positive diplococci and a few short chain streptococci. She has seen several ophthalmologists, who declared that they saw no pathologic condition. Roentgenograms of the sinuses show polypoid changes in the antrums. There is a morning hacking cough until a few blobs of sputum can be expectorated. Nose and throat examinations were not remarkable. A mild hypochromic anemia existed and has been corrected. Wassermann and Hinton tests were negative. The urine on several occasions showed no abnormality. The blood pressure was repeatedly 120-140 systolic and 80-90 diastolic. The scleras are clear and the conjunctivae are but slightly injected. During the day the eyes appear to be perfectly normal. The basal metabolism is $+12$. She must use three different pairs of glasses for proper vision, depending on the use to which she is putting her eyes. Can you suggest a cause or a line of investigation to determine the cause, and the treatment? A drop of mercurochrome in each eye nightly has given slight relief and that is the best she has been able to get since the onset.

M D, Massachusetts

ANSWER.—It is difficult to evaluate the importance of the signs in this case. Many of the symptoms resemble those of the common asthenopia in which use of the eyes is difficult even when all refractive error is properly corrected. There is a definite psychic element in such cases, but help may be afforded by certain exercises and by the use of prisms to correct all muscle imbalance for close work. There seems to be some chronic conjunctival irritation, although the signs of it are slight. If positive cultures of streptococci or pneumococci are obtained, this infection may be cleared up by proper antiseptics, but slight congestion and secretion should not cause such extreme symptoms. The swellings of the lids should be seen by the physician to be considered of importance. Swelling which disappears before the doctor can see it is not likely to indicate any serious condition.

POSSIBLE ETHYLENE GLYCOL POISONING

To the Editor.—A man aged 31, a worker in a powder factory, has been exposed to a substance known as ethylene glycol for the past three years. He had been well until a few months ago, except for influenza in 1918 and an automobile accident four years ago in which several ribs and the right clavicle were fractured and the head injured. Three months ago he began to experience shortness of breath on effort and a burning feeling in the epigastrium. At one time he had a severe attack which caused him to break out in a cold sweat. Examination by two cardiologists and myself revealed a healthy looking man. Blood pressure was 130 systolic and 90 diastolic and the pulse was irregular. The first sound at the apex was reduplicated, the second sound at the base slightly accentuated. There were no murmurs. The orthodiagram was normal. The electrocardiogram showed auricular flutter. There were no signs of rheumatic or thyroid heart disease. Small doses of digitalis caused his heart to revert to normal rhythm. I shall appreciate any information you may give me concerning this case.

M D, Pennsylvania.

ANSWER.—No opinion can be formed from the query as to the extent of exposure to ethylene glycol. Exposure to concentrations higher than 25 parts per million has been associated with injury. Assuming actual exposure, the symptoms mentioned are compatible with a diagnosis of ethylene glycol poisoning, but the outstanding features of such poisonings are not mentioned, namely mental disturbance and injury to the blood cells. A definite anemia does not always arise, but leukopenia

is fairly constant. In the typical case, several or all of the following features may arise: excessive fatigability, drowsiness, shortness of breath, visual blurring, conjunctival and respiratory tract irritation, nausea and vomiting, headache, nocturia, muscle hypertonicity, disorientation, anemia, leukopenia and many young blood cell forms.

In the present instance the suggestive evidence is sufficient to warrant the prompt removal of the patient and others similarly involved from the exposure environment pending further medical and environmental examination. Poisoning from this agent is discussed in detail in the following publications:

- Donley, D. E. Toxic Encephalopathy and Volatile Solvents in Industry. Report of a Case, *J. Indust. Hyg & Toxicol* 18:571 (Oct.) 1936.
Parsons, C. E., and Parsons, Malvina E. M. Toxic Encephalopathy and "Granulopenic Anemia" Due to Volatile Solvents in Industry. Report of Two Cases, *ibid* 20:124 (Feb.) 1938.
Greenburg, Leonard, Mayers, May R., Goldwater, L. J., and Burke W. J. Health Hazards in the Manufacture of "Fused Collars." I. Exposure to Ethylene Glycol Monomethyl Ether, *ibid* 20:148 (Feb.) 1938.
Wiley, F. H., Hueper, W. C., Bergen, D. S., and Blood, F. R. The Formation of Oxalic Acid from Ethylene Glycol and Related Solvents, *ibid* 20:269 (April) 1938.
Laug, E. P., Calvery, H. O., Morris, H. J., and Woodard, G. The Toxicology of Some Glycols and Derivatives, *ibid* 21:173 (May) 1939.

VARICOSE VEINS ABOVE THE KNEE

To the Editor.—A patient said that a doctor told her that it is dangerous to inject varicose veins above the knee. Is this true?

M D, Massachusetts

ANSWER.—When injections of sclerosing solutions are made into varicosities above the knee, an ascending thrombosis may occur up to the saphenofemoral junction. While such a thrombus only infrequently extends into the femoral vein and thus becomes a source of pulmonary embolism, this is a distinct possibility. The injection of veins above the knee, however, is not so much dangerous as it is futile. It only infrequently results in permanent obliteration, as the back pressure of blood from above canalizes the thrombus; but even if the main saphenous trunk should remain closed, the tributaries entering the saphenous vein close to its junction with the femoral will enlarge and produce a recurrence. For these reasons a high division of the main trunk and its tributaries should always precede the injection treatment of varicose veins whether they are above or below the knee. The permanent results of this combined treatment are satisfactory.

ROUGE FOR BUFFING AND PULMONARY TUBERCULOSIS

To the Editor.—A young man presenting symptoms of tuberculosis but no auscultatory signs has an infiltration of the left upper chest as revealed by a roentgenogram. A recheck showed an increase in this infiltration after three weeks. This man works with two materials which generate a fine dust. The composition of these materials is not known. One material, was slate colored and hard, is purchased from the Hanson, Vne Winkle Munning Company, Chicago, and the other is purchased from the Buckeye Products Company, Vine Street, Cincinnati. The latter product is brick red and brittle. Both products are called rouge for buffing. What is the composition of these materials and are they responsible for the infiltration of the lung? Could they aggravate an existing inflammation of the lung?

James R. Bone, M.D., Cincinnati

ANSWER.—Rouge used for buffing is ordinarily composed of iron oxide, and this material, unless contaminated by a high percentage of free silica, does not produce serious pulmonary reaction. Without knowledge of the composition of the particular materials it is impossible to prognosticate its effects on the lungs of an exposed workman. The fact that the roentgenogram shows a localized infiltration of the upper portion of one pulmonary field is more suggestive of an infectious than a silicotic process. It is possible that if the mineral should prove to contain significant quantities of free silica the roentgenogram might indicate a combination of silicotic and tuberculous changes.

SWELLING OF DORSUM OF HAND

To the Editor.—About a year ago a patient struck his right hand against a desk and has had persistent swelling of the dorsum of the hand over the second metacarpal bone. Roentgenograms have been negative for fracture, dislocation or bony pathologic changes. With the fingers extended, the swelling is about the size of a walnut and, with the fingers flexed, the size of a small lemon. It is firm to palpation and somewhat painful, and seems to be connected with the bone. What would be the most probable diagnosis?

M D, Louisiana

ANSWER.—1. Simple ganglion.
2. Tuberculous tenosynovitis.

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THE DIAGNOSIS AND TREATMENT OF MILD VITAMIN DEFICIENCIES

A CLINICAL DISCUSSION

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The recognition of a full blown vitamin deficiency such as acute pellagra, beriberi with peripheral neuritis, ariboflavinosis, scurvy and rickets is relatively simple. The characteristic dermatitis, the appearance of the gums, mouth and tongue, the cheilosis, the keratitis, the mental confusion or delirium, the diarrhea and the paresthasias of the extremities constitute a picture familiar to all and need no elaboration. It is now generally accepted that an easily recognizable clinical picture results from an advanced deficiency of the following vitamins: A, B₁ (thiamine hydrochloride), nicotinic acid, riboflavin, C (ascorbic acid), D and K.¹ While a number of other vitamins have been identified, there is still some doubt that their deficiency produces a characteristic syndrome in man.

In recent years many excellent communications² dealing with deficiencies of the B complex have appeared. It has been shown also by numerous observers that single vitamin deficiencies rarely if ever occur, a fact generally accepted today and one which should be borne in mind constantly when the question of treatment is being considered.

It is reasonable to assume that all grades of deficiencies exist, ranging from those which are totally unrecog-

nizable in the light of our present knowledge to those presenting the characteristic features that have just been mentioned.

It is highly probable that for every patient having an advanced vitamin deficiency there are many patients having a subclinical or mild deficiency state. It is with this group that my concern lies at the present time.

DIAGNOSIS

While the diagnosis of advanced deficiency states usually is easy, the recognition of the mild or early vitamin deficiency is much more difficult. The diagnosis would obviously depend on a correct evaluation of the symptoms, signs and accessory findings in any given case, and also on the response to specific therapy. It must be pointed out, however, that improvement after vitamin therapy in such symptoms as flatulence, indigestion, weakness, nervousness and irritability does not necessarily constitute proof of a deficiency state, as the same improvement frequently is encountered when a patient having these symptoms is treated with such drugs as phenobarbital and belladonna. Improvement in such a vague clinical picture should be construed only as suggestive evidence of a state of subclinical deficiency.

Naturally the history of subsistence on a grossly inadequate diet would lead one to suspect the presence of an early vitamin deficiency, and it must be admitted that, in spite of an intensive educational program, the diet of the average tenant farmer of the South during the late fall, winter and early spring months is still definitely deficient, generally consisting of white bread, corn bread, hominy grits, potatoes (usually fried), fat back and other pork products, cow peas and molasses. Idiosyncrasies of diet, food faddism and ill balanced reducing diets also may lead to deficiency states.

SYMPTOMS

Among the early symptoms of vitamin deficiencies are anorexia with ensuing loss of weight, weakness, lassitude and easy fatigability, insomnia, increased nervousness and irritability, headache, palpitation, precordial distress, vague gastrointestinal disturbances such as flatulence, indigestion, constipation or mild diarrhea, nausea and indefinite abdominal pain. The patient usually just does not feel well without being able to state exactly what is wrong. One realizes at once that the symptoms of the so-called gastric neuroses, psychoneuroses and neurasthenias are essentially those mentioned. While it is entirely possible that these conditions are in reality expressions of an early avitaminosis,

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Read before the Section on Pharmacology and Therapeutics at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1. Mackie, T. T.; Eddy, W. H., and Mills, M. A.: Vitamin Deficiencies in Gastrointestinal Disease, *Ann. Int. Med.* **14**: 28-41 (July) 1940.

2. These include:

Sydenstricker, V. P.: The Clinical Manifestations of Nicotinic Acid and Riboflavin Deficiency (Pellagra), *Ann. Int. Med.* **14**: 1499 (March) 1941.

Spies, T. D., and Cooper, Clark: Vitamin Deficiency, The Diagnosis of Pellagra, *Internat. Clin.* **4**: 1-11 (Dec.) 1937.

Sebrell, W. H., and Butler, R. E.: Riboflavin Deficiency in Man. A Preliminary Note, *Pub. Health Rep.* **53**: 2282 (Dec. 30) 1938.

Jolliffe, Norman; Bowman, K. M.; Rosenblum, L. A., and Fein, H. D.: Nicotinic Acid Deficiency Encephalopathy, *J. A. M. A.* **114**: 307-312 (Jan. 27) 1940.

Jolliffe, Norman: The Diagnosis, Treatment and Prevention of B₁ Deficiency, *Bull. New York Acad. Med.* **15**: 469 (July) 1939.

Matthews, R. S.: Pellagra and Nicotinic Acid, *J. A. M. A.* **111**: 1148 (Sept. 24) 1938.

Kruse, H. D.; Sydenstricker, V. P.; Sebrell, W. H., and Cleckley, H. M.: The Ocular Manifestations of Ariboflavinosis, *Pub. Health Rep.* **55**: 157-169 (Jan. 26) 1940.

still in the present state of our knowledge it must be admitted that such a relationship is often difficult, if not impossible, to prove.

It is also difficult to determine whether these early symptoms are due to a deficiency of one particular

time in the province of the special investigator. So far as the general practitioner is concerned, the diagnosis will depend largely on a proper evaluation of the symptoms and signs as here described and their response to specific therapy.

TABLE 1.—Symptoms of Early Subclinical Deficiencies According to Other Authors (in Order Listed)

Pellagra ^{3a}	Spontaneous Thiamine Deficiency ^{3b}	Induced Thiamine Deficiency ^{3c}	Vitamin B ₆ Deficiency ^{3d}
Fatigue	Fatigue	Depressed mental states	Extreme nervousness
Insomnia	Anorexia	Generalized weakness	Insomnia
Anorexia	Insomnia		Irritability
Vertigo	Irritability		Abdominal pain
Paresthesia	"Gas"	Dizziness	Weakness
Palpitation	Nausea	Backache	Difficulty in walking
Nervousness	Constipation	Soreness of muscles	
Headache	Discomfort in abdomen	Palpitation	
Forgetfulness	Depression	Dyspnea	
Apprehension	Backache	Precordial distress	
Distractibility	Headache	Insomnia	
	Sighing	Anorexia	
	Palpitation	Nausea	
	Precordial distress	Vomiting	
		Loss of weight	
		Atony of muscles	

vitamin or to a combination of them. For example, the symptoms of subclinical pellagra, of spontaneous and induced thiamine and of B₆ (pyridoxine) deficiencies listed in four different communications³ are practically identical (table 1). From such a description, obviously it is impossible to identify an early nicotinic acid, a B₁ or a B₆ deficiency. The answer, of course, lies in the fact that single deficiencies rarely if ever occur spontaneously, and the syndrome referred to by these authors is in all probability that of an early mixed deficiency. One should take the position that patients presenting such symptoms should be suspected of having an early unspecified and probably mixed deficiency, but a definite diagnosis should be made only after more positive evidence has been obtained.

MANIFESTATIONS NECESSARY FOR DIAGNOSIS

It has been stated that advanced deficiencies of vitamins A, B₁, nicotinic acid, riboflavin and vitamins C, D and K result in easily recognizable clinical pictures and that the earliest symptoms of these deficiencies are so vague and indefinite as to render accurate classification impossible. However, at some stage in the development of a deficiency state there must come a time when certain conditions are present which will justify the diagnosis. The significant symptoms, signs and laboratory findings that are necessary for the recognition of various mild vitamin deficiencies are shown in table 2.

Most of the laboratory procedures mentioned require special apparatus and well trained technicians. The determinations of the blood level of vitamin C and the prothrombin time can be carried out in any well equipped laboratory, but the demonstration of a vitamin A, a nicotinic acid, a vitamin B₁ or a riboflavin deficiency by laboratory procedures lies at the present

TREATMENT

Dietary Treatment.—Theoretically, the treatment of the mild vitamin deficiencies is simple and may be described in a few words: a well balanced diet to which may be added such vitamins as are indicated in the individual case. The patient should be urged to eat a variety of meats, green vegetables, milk, eggs and fruit juices. If such a diet is followed, and if there is no underlying disease which interferes with proper absorption and utilization, recovery is the rule.

Unfortunately, it is one thing to prescribe a diet, but having the patient follow it is quite another matter. There are few of us who are willing to change the habits of a life time. This is particularly true of tenant farmers, most of whom were raised on a deficient diet and show no inclination to change it even though they are warned that its continuance may prove detrimental to their health. The economic factor likewise plays a large part. The deficient diet to which these people are accustomed is much cheaper than a well balanced one, and many of these patients simply cannot

TABLE 2.—Symptoms, Signs and Laboratory Findings Necessary for Diagnosis of Mild Vitamin Deficiencies*

Vitamin Deficiency	Symptoms and Signs	Significant Laboratory Findings
A	Night blindness, scaly skin?, hyperkeratosis	Decrease in blood level of vitamin A; adaptometer test (doubtful value unless visual threshold improves after administration of A) Stevens, D. and Wald, G. J. Nutrition 21: 461 (May) 1941
B ₁	Paresthesia of extremities, muscle tenderness, impairment of vibratory sense, decreased tendon reflexes	Decrease in urinary excretion of thiamine (blood level remains about same)
Nicotinic acid	Sore mouth and tongue, redness of tongue margins and papillary atrophy, diarrhea, roughening, redness and sealiness of dorsum of hands, increased pigmentation over bony prominences	Decrease in urinary excretion of nicotinic acid derivatives (blood level remains about same)
Riboflavin	Photophobia and lacrimation, cheilosis, sore tongue with purplish color	Vascularization of cornea (slit lamp examination)
C	Irritability, spongy, bleeding gums, bone and joint pain, petechial hemorrhages (occur in other conditions also), bleeding	Lowering of vitamin C in plasma
D	Muscle weakness, head sweats	Low blood phosphorus, elevation of serum phosphatase, roentgen changes
K	Bleeding	Increased prothrombin time

* Modification of table by Mackle⁴

afford to buy the articles of food that they need. Foods rich in the various vitamins are shown in table 3.⁴

Vitamin Therapy.—When specific and recognizable deficiencies are found, vitamin therapy is definitely indicated but should always supplement the dietary treat-

3 (a) Spies, T. D.; Aring, C. D.; Gelperin, Jules, and Bean, W. B. The Mental Symptoms of Pellagra, Their Relief with Nicotinic Acid, *Am. J. M. Sc.* 196: 461 (Oct.) 1938. (b) Jolliffe, Norman. Vitamin Deficiencies and Liver Cirrhosis in Alcoholism, *Quart. J. Stud. on Alcohol* 1: 517 (Dec.) 1940. (c) Williams, R. R.; Mason, H. L.; Wilder, R. M., and Smith, B. F.: Observations on Induced Thiamine (Vitamin B₁) Deficiency in Man, *Arch. Int. Med.* 66: 785-799 (Oct.) 1940. (d) Spies, T. D.; Bean, W. B., and Ashe, W. F.: A Note on the Use of Vitamin B₆ in Human Nutrition, *J. A. M. A.* 112: 2414-2415 (June 10) 1939.

4 (a) Sherman, H. C., and Lanford, C. S.: *Essentials of Nutrition*, New York, Macmillan Company, 1940, table 27, p. 371. (b) Backlund, A. L.: The Distribution of Nicotinic Acid in Human and Animal Foods, *Nutrition Abstr. & Rev.* 10: 459, 1941.

ment, never replace it. In our experience, when one is reasonably sure that a specific deficiency is present, the best results are obtained only if the patient is given adequate doses of the vitamin or vitamins in which he is lacking. In deficiencies of the water soluble vitamins, if no improvement is noted after ten to fourteen days of treatment, it is improbable that continued

TABLE 3.—*Foods Rich in Vitamins (According to Sherman and Lanford ^{4a})*

A	B ₁	Nicotinic Acid ^{4b}	Riboflavin	C
Greens	Yeast	Liver	Brewers' yeast	Green peppers
Spinach	Wheat germ	Brewers' yeast	Liver	Broccoli
Kale	Ham	Beef	Kidney	Kale
Turnips	Pork	Salmon	Cheese	Turnip greens
Collards	Liver	Peanuts	Eggs	Collards
Liver	Kidney	Whole wheat bread	Ham	Cauliflower
Butter	Eggs	Soy beans	Spinach	Lemons
Cheese	Nuts	Spinach	Beef	Oranges
Carrots	Green peas	Lamb	Milk	Grapefruit
Broccoli	Lima beans	Tongue	Broccoli	Cabbage
Eggs	Shad roe	Shad roe	Collards	Tomatoes
Squash	Corn meal	Green peppers	Peas	Strawberry

Vitamin K is present in almost all green vegetables

therapy will prove of value, and certainly there is little justification for continuing it longer than from three to four weeks. With the fat soluble vitamin deficiencies, however, especially vitamin A, it may be necessary to continue treatment for a longer period of time. The most outstanding feature of the treatment of acute and severe vitamin deficiencies is the remarkable rapidity with which symptoms subside when specific deficiencies are corrected by the administration of specific vitamins. It is justifiable to assume that in the mild deficiencies improvement should be noted just as rapidly as in the severe ones, and failure of the patient to improve after a reasonable length of time means either that there is a mistaken diagnosis or that irreversible changes have taken place. In such cases further vitamin therapy is futile.

In certain instances, the parenteral administration of vitamins is not only justified but definitely indicated. In the preparation of the patient for an abdominal operation it is customary to administer large quantities of dextrose and saline solution by vein or subcutaneously.

It has been emphasized by several writers that such a procedure may precipitate an acute deficiency state which might prove serious if not recognized and corrected. It is wise, therefore, whenever a subclinical deficiency is suspected, to give these patients, along with their dextrose, nicotinic acid, thiamine hydrochloride, riboflavin and ascorbic acid as a part of the preoperative care. In fact, the question of gastrointestinal absorption of vitamins is so poorly understood at the present time that one is justified in administering certain of the vitamins parenterally when specific deficiencies are suspected. This is particularly true in vitamin B₁ and nicotinic acid deficiencies. It is customary to give 100 to 200 mg. of nicotinic acid and 20 to 30 mg. of thiamine hydrochloride intravenously for from three to five days even though the deficiency is mild, continuing with the oral administration in much smaller doses for two to three weeks. The dosage recommended, after an initial three to five day period in which larger doses are used either by mouth or parenterally, is shown in table 4.

The fact that single deficiencies are rarely, if ever, encountered is an excellent argument against the treatment of deficiency states with chemically pure substances. There are probably other vitamins as yet unknown which are essential to health. It is generally believed that yeast and whole liver contain most of the vitamins of the B complex, and it is a good practice when the patient can afford it to give whole liver, or an extract of liver, either by mouth or intramuscularly. If liver extract cannot be obtained, brewers' yeast or autolyzed yeast (vegex) is a satisfactory substitute. This point is well illustrated by the following case.

REPORT OF CASE

J. H. D., a white man aged 26, admitted to Duke Hospital Feb. 5, 1940, complained of loss of weight, diarrhea, weakness, sore tongue and tingling and numbness of the extremities of six months' duration. On examination he was emaciated but mentally alert. There were fissures at the corners of the mouth. The tongue was beefy red with papillary atrophy. There was some redness of the dorsum of the hands and considerable roughening and scaliness of the skin over the body, with enlargement of the hair follicles.

The significant accessory findings were a macrocytic anemia, a hemoglobin content of 13.2 Gm. and a red blood cell count of 2,400,000; there was no free acid after histamine; the dextrose tolerance curve was flat and stool fat was 38 per cent. The ascorbic acid content of the blood was too low to be measured, being less than 0.1 mg. per hundred cubic centimeters of plasma.

A diagnosis of multiple vitamin deficiencies was made, including sprue, pellagra, scurvy and either a riboflavin or a pyridoxine deficiency. He was given pyridoxine 50 mg. daily intravenously for ten days, with no appreciable improvement. Large intravenous doses of nicotinic acid, of riboflavin and of ascorbic acid failed to produce any effect. However, Lederle's liver extract 3 cc. daily was followed by rapid improvement and eventually complete recovery.

One must not lose sight of the fact that many mal-adjusted and neurasthenic persons have a coexisting mild vitamin deficiency. It is important, of course, to correct this deficiency by diet if possible, supplemented by vitamins if necessary. It is equally important to realize that vitamins are not the panacea of all ills;

TABLE 4.—*Recommended Dosage of Vitamins in Treatment of Mild Deficiencies*

Vitamin	Dosage (Oral)
A...	15,000-20,000 U. S. P. units a day
Thiamine hydrochloride	5 mg. three times a day
Nicotinic acid	50 mg. three times a day
Riboflavin	1 mg. three times a day
Ascorbic acid.	0.1 Gm. three times a day
D	2,000 2,500 U. S. P. units a day
K	1 mg. daily

that they afford little relief in social, financial or domestic problems; that long continued treatment with expensive vitamins is a serious and unnecessary drain on the patient's pocketbook and that, in the last analysis, a well balanced diet is the best treatment in most of the cases of mild vitamin deficiencies.

COMMENT

My purpose in this communication is to call attention to the fact that while vitamin deficiencies constitute an extremely important group of diseases, the trend of recent events leads one to feel that both the public and the medical profession have become overenthusiastic on

the subject of vitamins. There is a rapidly growing tendency today to attribute most of the ills of the human race to a deficiency of this or that vitamin. The suggestion is being made that the neurotic, the neurasthenic, the mentally retarded, the biologically unfit or constitutional inferiority are often expressions of deficiency states. This may or may not be true; certainly it is extremely difficult to prove any causal relationship. It is entirely possible that many of them are the result of subclinical deficiency states existing since birth. If this is true it is highly probable that, in the adult at least, irreversible intracellular changes have taken place and vitamin therapy even over a prolonged period of time will be of little value. They should not be denied the benefit of vitamin therapy, but it is much more important to prescribe an adequate diet than to allow the patient to continue eating a restricted one and hope to make up for its deficiencies by the addition of various vitamins. It should be emphasized also that when specific deficiencies occur the response to specific therapy is unusually rapid and dramatic, and if the patient shows no improvement after three or four weeks there is little justification in allowing him to continue to buy drugs, especially those containing the B complex, which in all probability will benefit only the manufacturer. Contrary to the report of others,⁵ my experiences in the treatment of patients suspected of having a mild deficiency with the known members of the B complex have been disappointing. It is true that many will report temporary improvement, but this hardly justifies the conclusion that the vitamins that were given to the patient were responsible for this improvement, for the factor of psychotherapy has to be taken into consideration. If conditions at home are bad, if the patient is overworked and underfed as many of our clinic patients are, if financial worries or domestic unhappiness weigh heavily on him, usually he returns six months or a year later with the same or new complaints. There is little to justify long-continued vitamin therapy in a patient whose domestic life is such as to make health and happiness difficult if not impossible to attain. For example, the farmwife who at the age of 30 has borne six children, who does all the housework including the cooking, washing and ironing and then works in the fields during the day can expect little relief from her weakness, nervousness, headache, fatigability, low back pain, abdominal distress and vague digestive disturbances by the administration of vitamins. What she obviously needs is not vitamins but rest, a well balanced diet and a complete change in her daily routine. She represents what may be called a social and economic rather than a medical problem.

When a mild vitamin deficiency is recognized, or even suspected, certainly therapy should be instituted at once, but it must be remembered that by far the best treatment is an adequate diet, specific vitamins being used only as supplementary therapy. The solution of the problem of the deficiency diseases lies not so much in the cure of the deficiency as in its prevention, not in the administration of pills but in an educational and social program which will not only teach the poorer classes what to eat but make it possible for them to secure the articles of food which are necessary for the maintenance of health.

5. Spies, T. D.; Swain, A. P., and Grant, J. M.: Clinically Associated Deficiency Diseases. *Am. J. M. Sc.* 200:536 (Oct.) 1940.

TREATMENT OF NEUROPSYCHIATRIC DISORDERS WITH VITAMINS

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During the past decade vitamin deficiency has been looked for and often found in many neuropsychiatric disorders. It must be emphasized, however, that merely finding a vitamin deficiency concurrent with a disease does not indicate that this deficiency is the cause of the original disease. Secondary or "conditioned" vitamin deficiencies should be clearly distinguished from the original or primary disease, else utter confusion will result.

Almost every vitamin has also been credited with playing a role in the maintenance of a normal nervous system. The more important of the vitamins thus accredited are thiamine hydrochloride, nicotinic acid, riboflavin, pyridoxine and alpha-tocopherol. Only thiamine hydrochloride and nicotinic acid, however, have been related clinically in a definite causal role to neuropsychiatric syndromes in man.

The sequence of events in a vitamin deficiency disease begins with an inadequate vitamin supply, due to failure to ingest, absorb or utilize, followed in succession by tissue depletion, biochemical "lesions,"¹ reversible anatomic changes and finally irreversible anatomic lesions. Adequate treatment initiates the sequence of tissue replenishment, early disappearance of the biochemical "lesions" and less rapid disappearance of the reversible anatomic lesions. The importance of early diagnosis and treatment is obvious.

The neuropsychiatric conditions in which there is substantial evidence that a vitamin deficiency may play an etiologic role are listed in table 1. This table includes the vitamin or vitamins predominantly concerned, an evaluation of vitamin therapy and references to the literature for each of the conditions listed. The evaluation of therapy concerns only the primary disease and is made without prejudice to the value of vitamins in the prevention or treatment of a secondary deficiency. This table does not include a number of neuropsychiatric syndromes, such as sciatica, eighth nerve deafness and other single nerve neuropathies, herpes zoster, hysteria, impotence and psychogenic pain, for which vitamins have been recommended because of their drug action or for use as a placebo, in which conditions the rationale of their use is dubious or the results claimed can be explained equally well or better as fortuitous.

A neurasthenic syndrome is probably the earliest and most frequent manifestation of both thiamine deficiency²

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1. Peters, R. A.: The Biochemical Lesion in Vitamin B₁ Deficiency. *Lancet* 1:1161 (May 23) 1936.

2. Williams, R. D., Mason, H. L., and Smith, B. F.: Induced Vitamin B₁ Deficiency in Human Subjects. *Proc. Staff Meet., Mayo Clin.* 14:787 (Dec. 13) 1939. Williams, R. D., Mason, H. L., and Smith, B. F.: Observations on Induced Thiamine (Vitamin B₁) Deficiency in Man. *Arch. Int. Med.* 66:785 (Oct.) 1940. Jolliffe, Norman; Goodhart, Robert; Gennis, J., and Cline, J. K.: The Experimental Production of Vitamin B₁ Deficiency in Normal Subjects: The Dependence of the Urinary Excretion of Thiamine on the Dietary Intake of Vitamin B₁. *Am. J. M. Sc.* 198:198 (Aug.) 1939. Jolliffe, Norman; J. Stud. on Alcohol 1:517 (Dec.) 1940. Recent Advances in the Applications of the B Vitamins. *J. Am. Diet. A.* 17:5 (Jan.) 1941. Newer Knowledge of the Vitamin B Complex. *Bull. New York Acad. Med.* 17:195 (March) 1941.

and pellagra.³ As in neurasthenic syndromes of any origin, the symptomatology is varied but the outstanding characteristics are anorexia, fatigue and insomnia. It should not be inferred that all neurasthenia is based on vitamin deficiency. Such is definitely not the case.

The polyneuropathies of thiamine deficiency,⁴ whether mild or severe, are bilateral and symmetrical and characteristically involve first and predominantly the lower extremities. Peripheral neuropathy that involves a single nerve, that is not bilateral and symmetrical or that does not involve first and predominantly the lower extremities is not, in my experience, due to thiamine deficiency alone. The polyneuropathies fulfilling the foregoing criteria occurring in association with beriberi, alcoholism, pellagra, pregnancy, cachexia, diabetes, hyperthyroidism and chronic diarrheal diseases are usually a manifestation of thiamine deficiency. There is often coexisting latent or manifest deficiency of other vitamins.

Wernicke's disease⁵ occurs most often, but not exclusively, in association with chronic alcoholism. It is characterized clinically by ophthalmoplegia, polyneuropathy, ataxia and progressive clouding of consciousness. It is usually associated with multiple vitamin deficiencies. Thiamine, when administered in adequate amounts, relieves the ophthalmoplegia within forty-eight to ninety-six hours.⁶ The mental status is frequently but not consistently improved by thiamine therapy.

The mental symptoms most commonly seen in pellagra⁷ are those usually seen in any organic psychosis.

These include memory defects, disorientation, confusion and confabulation. Periods of excitement, depression, mania, delirium and paranoia occur not infrequently. These cerebral disorders may appear before other signs of pellagra are evident. Response to nicotinic acid is usually prompt, especially when the psychosis is of short duration. In the psychoses of longer duration the response is by no means spectacular, and frequently specific therapy does not help at all. This means that in the latter cases the processes may have advanced to the irreversible anatomic stage. It must be emphasized, however, that pellagrins lack other dietary factors necessary for normal brain metabolism, and these deficiencies may contribute to the cerebral manifestations. Adequate amounts of all other nutritive essentials should therefore be given in order to obtain a maximal therapeutic response.

Nicotinic acid deficiency encephalopathy is a term used by us⁸ to designate a syndrome characterized by sucking and grasping reflexes, changing cogwheel rigidities and progressive clouding of consciousness. This syndrome⁹ is seen most frequently in association with chronic alcoholism, endemic pellagra, senility and cirrhosis of the liver. In our study of 150 cases the mortality was reduced from above 90 per cent to 15 per cent by nicotinic acid therapy. It should be emphasized, however, that these patients are usually left with organic memory defects. Most of these subjects are in the elder age group and their conditions are probably complicated by cerebral arteriosclerosis.

A relationship of thiamine, nicotinic acid and ascorbic acid to infantile paralysis,¹⁰ delirium tremens¹¹ or Korsakoff's psychosis¹² has been suggested but, in my opinion, has not been proved. In all these, as in many other diseases, an associated or secondary vitamin deficiency may occur. In delirium tremens the decided increase in total metabolism raises the vitamin requirements to such an extent that an acute deficiency may be precipitated from which the patient may die unless attention is given to insuring adequate nutrition.

The value of alpha-tocopherol and pyridoxine in the syndromes of muscular dystrophy, amyotrophic lateral

- 3 Spies, T. D.; Bean, W. B., and Stone, R. E. The Treatment of Subclinical and Classic Pellagra. Use of Nicotinic Acid Amide and Sodium Nicotinate, with Special Reference to the Vasodilator Action and the Effect on Mental Symptoms. *J. A. M. A.* **111**: 584 (Aug 13) 1938.
- Spies, T. D., Aring, C. D., Gelpert, Jules, and Bean, W. B. The Mental Symptoms of Pellagra. Their Relief with Nicotinic Acid. *Am. J. M. Sc.* **196**: 461 (Oct.) 1938.
- McLester, J. S. Borderline States of Nutritive Failure. *J. A. M. A.* **112**: 2110 (May 27) 1939.
- Spies, T. D., and Aring, C. D. Effect of Vitamin B₁ on the Peripheral Neuritis of Pellagra. *ibid.* **110**: 1081 (April 2) 1938.
- Sydenstricker, V. P.
- 4 Jolliffe, Norman, Colbert, C. N., and Joffe, P. M. Observations on the Etiologic Relationship of Vitamin B₁ to Polyneuritis in the Alcohol Addict. *Am. J. M. Sc.* **191**: 515 (April) 1936.
- Jolliffe, Norman, and Colbert, C. N. The Etiology of Polyneuritis in the Alcohol Addict. *J. A. M. A.* **107**: 642 (Aug 29) 1936.
- Goodhart, Robert, and Jolliffe, Norman. Effects of Vitamin B₁ (B₁) Therapy on the Polyneuritis of Alcohol Addicts. *ibid.* **110**: 414 (Feb 5) 1938.
- Jolliffe, Norman, and Goodhart, Robert. Beriberi in Alcohol Addicts. *ibid.* **111**: 380 (July 30) 1938.
- Jolliffe, Norman, and Rosenblum, L. A. Circulatory Manifestations of Vitamin Deficiency. Diagnosis, Treatment and Prevention. *M. Clin. North America* **23**: 759 (May) 1939.
- Jolliffe, Norman. The Diagnosis, Treatment, and Prevention of Vitamin B₁ Deficiency. *Bull. New York Acad. Med.* **15**: 469 (July) 1939.
- Recent Advances in the Therapeutic Use of the B Vitamins. *M. Clin. North America* **24**: 733 (May) 1940.
- Fein, H. D., Ralli, Elaine P., and Jolliffe, Norman. Peripheral Neuropathy Due to Vitamin B₁ Deficiency in Diabetes Mellitus. *J. A. M. A.* **115**: 793 (Dec 7) 1940.
- Wechsler, I. S. Unrecognized Cases of Deficiency Polyneuritis (Avitaminosis?). Preliminary Report. *M. J. & Rec.* **131**: 441 (May 7) 1930.
- Etiology of Polyneuritis. *Arch. Neurol. & Psychiat.* **29**: 813 (April) 1933.
- Vorhaus, M. G., Williams, R. R., and Waterman, R. E. Studies on Crystalline Vitamin B₁. Experimental and Clinical Observations. *J. A. M. A.* **105**: 1580 (Nov. 16) 1935.
- Borson, H. J. Clinical Application of the Thiochrome Reaction in the Study of Thiamin (B₁) Deficiency. *Ann. Int. Med.* **14**: 1 (July) 1940.
- Tantus, Bernard, editor, with Traut, E. F., and Greenbaum, R. S. The Therapy of the Cook County Hospital. The Therapy of Subvitaminosis B₁. *J. A. M. A.* **115**: 450 (Aug 10) 1940.
- Meiklejohn, A. P. Is Thiamine the Antineuritic Vitamin? *New England J. Med.* **223**: 265 (Aug 22) 1940.
- Brown, M. R. Alcoholic Polyneuritis. An Evaluation of Treatment at the Boston City Hospital from 1920 Through 1938. *J. A. M. A.* **116**: 1615 (April 12) 1941.
- Spies and Aring.³
- 5 Campbell, A. C. P., and Biggart, J. H. Wernicke's Encephalopathy (Pseudoencephalitis Hemorrhagica Superior). Its Alcoholic and Nonalcoholic Incidence. *J. Path. & Bact.* **48**: 245 (March) 1939.
- Alexander, Leo. Topographic and Histologic Identity of the Experimental (Avitaminotic) Lesions of Wernicke with Lesions of Hemorrhagic Pseudoencephalitis Occurring in Chronic Alcoholism in Men. *Arch. Neurol. & Psychiat.* **42**: 1172 (Dec.) 1939.
- Jolliffe, Norman. Neuropsychiatric Manifestations of Vitamin Deficiencies, read at the Section of Medicine, New York Academy of Medicine, Jan. 21, 1941, to be published. Jolliffe, Wortis and Fein.⁶
- 6 Jolliffe, Norman, Wortis, Herman, and Fein, H. D. The Wernicke Syndrome. *J. Nerv. & Ment. Dis.* **93**: 214 (Feb.) 1941.
- Arch. Neurol. & Psychiat., to be published.
- 7 Matthews, R. S. Pellagra and Nicotinic Acid. *J. A. M. A.* **111**: 1148 (Sept 24) 1938.
- Sydenstricker, V. P., Schmidt, H. L., Fulton, M. C., New, J. S., and Geeslin, L. E. Treatment of Pellagra with

- Nicotinic Acid. Observations in Forty Five Cases. *South. M. J.* **31**: 1155 (Nov.) 1938.
- Spies, T. D., Grant, J. M., Stone, R. E., and McLester, J. B. Recent Observations on Treatment of 600 Pellagrins, with Special Emphasis on Use of Nicotinic Acid in Prophylaxis. *ibid.* **31**: 1231 (Dec.) 1938.
- Spies, T. D., Vilter, R. W., and Ashe, W. F. Pellagra, Beriberi and Riboflavin Deficiency in Human Beings. *J. A. M. A.* **113**: 931 (Sept 2) 1939.
- Jolliffe. Recent Advances.² Newer Knowledge.² Spies, Aring, Gelpert and Bean.³
- 8 Jolliffe, Norman, Bowman, K. M., Rosenblum, L. A., and Fein, H. D. Nicotinic Acid Deficiency Encephalopathy. *J. A. M. A.* **114**: 307 (Jan 27) 1940.
- 9 Jolliffe, Norman. The Effects of Vitamin Deficiency on Mental and Emotional Processes. A Research Nerv. & Ment. Dis. *Proc.* (1938) **19**: 144, 1939.
- Cleckley, H. M., Sydenstricker, V. P., and Geeslin, L. E. Nicotinic Acid in the Treatment of Atypical Psychotic States Associated with Malnutrition. *J. A. M. A.* **112**: 2107 (May 27) 1939.
- Sydenstricker, V. P. The Present Status of Nicotinic Acid. *Arch. Int. Med.* **67**: 746 (April) 1941.
- Jolliffe, Norman, Rosenblum, and Fein.⁸
- 10 Heaslip, W. G. Vitamin C Nutrition and Susceptibility to Diphtheria as Possible Factors in the Epidemiology of Poliomyelitis. *Australian J. Exper. Biol. & M. Sc.* **16**: 287 (Dec.) 1938.
- Jungeblut, C. W. A Further Contribution to Vitamin C Therapy in Experimental Poliomyelitis. *J. Exper. Med.* **70**: 315 (Sept.) 1939.
- 11 Wortis, Herman. Delirium Tremens. *Quart. J. Stud. on Alcohol* **1**: 251 (Sept.) 1940.
- Rosenbaum, Milton, Piker, Philip, and Lederer, Henry. Delirium Tremens. Study of Various Methods of Treatment. *Am. J. M. Sc.* **200**: 677 (Nov.) 1940.
- Jolliffe, Norman, and Wortis, Herman. Encephalopathy Alcoholic. An Evaluation of Vitamin Therapy, read at the Annual Meeting of the American Psychiatric Association, Richmond, Va., May 9, 1941, to be published. Wortis, Herman, and Jolliffe, Norman. Present Status of Vitamins in Nervous Health and Disease. *New York State J. Med.*, to be published.
- Wortis, Herman, Wortis, S. B., and March, F. I. Vitamin C Studies in Alcoholics. *Am. J. Psychiat.* **94**: 891 (Jan.) 1938.
- Role of Vitamin C in Metabolism of Nerve Tissue. *Arch. Neurol. & Psychiat.* **39**: 1055 (May) 1938.
- Alexander, Leo, Pijoan, Michel, Schube, P. J., and Moore, Merrill. Lactic Acid Content of Blood Plasma in Alcoholic Psychoses. *ibid.* **40**: 58 (July) 1938.
- Spies, Aring, Gelpert and Bean.³
- 12 Bowman, K. M., Goodhart, Robert, and Jolliffe, Norman. Observations on the Role of Vitamin B₁ in the Etiology and Treatment of Korsakoff's Psychosis. *J. Nerv. & Ment. Dis.* **90**: 569 (Nov.) 1919.
- Jolliffe, Wortis and Fein.⁶

sclerosis and paralysis agitans has recently been the subject of conflicting reports.¹³ In all disorders which may be viewed as syndromes rather than as disease entities a positive response to treatment in but few patients may be significant, for it may indicate a curable disease entity within a syndrome previously considered irreversible. It seems reasonable, therefore, and in view of the conflicting reports and of the progressive nature of these syndromes, to give the vitamins on an experimental basis under carefully controlled conditions.

Syndromes collectively labeled paralysis agitans, while not directly fatal, usually follow a progressive course, the victims eventually becoming helpless. Since muscular rigidity and weakness are characteristic of

or bedfast, 10 for more than three years, and administered to each 50 or 100 mg. of pyridoxine parenterally, either daily or every other day for at least four weeks. Of the 15 patients 4 showed definite objective improvement. These results were reported in April 1940 before the Minnesota State Medical Association.¹⁴ Similar results were reported a short time later by Spies, Hightower and Hubbard.¹⁵ Two of the 4 patients who showed objective improvement have since died, one following a fracture of the femur and the other following a myocardial infarction; the improvement in these 2 patients was maintained until the onset of the terminal illness. The improvement in the third patient has now been maintained for more than fourteen

TABLE 1.—Neuropsychiatric Disorders for Which There Is Substantial Evidence That Vitamin Deficiency May Play an Etiologic Role

Disease or Syndrome	Predominant Vitamin Deficiency	Value in Therapy	References to Literature
A neurasthenic syndrome.....	(a) Thiamine.....	Yes	Williams, Mason and Smith. ² Williams, Mason, Wilder and Smith. ² Jolliffe, Goodhart, Gennis and Cline. ² Jolliffe. ²
	(b) Nicotinic acid....	Yes	Spies, Bean and Stone. ³ Spies, Aring, Gelperin and Bean. ³ McLester. ³ Spies and Aring. ³ Sydenstricker. ⁹
Polyneuropathy	Thiamine.....	Yes	Spies and Aring. ³ Jolliffe, Colbert and Joffe. ⁴ Jolliffe and Colbert. ⁴ Goodhart and Jolliffe. ⁴ Jolliffe and Goodhart. ⁴ Jolliffe and Rosenblum. ⁴ Jolliffe. ⁴ Fein, Ralli and Jolliffe. ⁴ Wechsler. ⁴ Vorhaus, Williams and Waterman. ⁴ Borson. ⁴ Fantus. ⁴ Melkejohn. ⁴ Brown. ⁴
Ophthalmoplegia of Wernicke's syndrome	Thiamine.....	Yes	Campbell and Biggart. ⁵ Alexander. ⁵ Jolliffe, Wortis and Fein. ⁶ Jolliffe. ⁶
Pellagra psychosis	Nicotinic acid....	Yes	Matthews. ⁷ Sydenstricker, Schmidt, Fulton, New and Geeslin. ⁷ Spies, Aring, Gelperin and Bean. ³ Spies, Grant, Stone and McLester. ⁷ Spies, Vilter and Ashe. ⁷ Jolliffe (Recent Advances; Newer Knowledge). ⁷
Nicotinic acid deficiency, encephalopathy.	Nicotinic acid....	Yes	Jolliffe, Bowman, Rosenblum and Fein. ⁸ Jolliffe. ⁹ Cleckley, Sydenstricker and Geeslin. ⁹ Sydenstricker. ⁹
Infantile paralysis	(a) Ascorbic acid....	No	Heaslip. ¹⁰ Jungeblut. ¹⁰
	(b) Thiamine.....	No	McCormick, W. J.: Poliomyelitis, <i>Canad. M. A. J.</i> 38:260 (March) 1933. Hamburger, F.: Bi-Vitaminmischung zur Verhütung der Poliomyelitis? <i>Wien. klin. Wchnschr.</i> 51:825 (Aug. 5) 1938. Jungeblut. ¹⁰
Delirium tremens	(a) Thiamine.....	No	Wortis. ¹¹ Rosenbaum, Piker and Lederer. ¹¹ Jolliffe and Wortis. ¹¹ Wortis and Jolliffe. ¹¹ Spies, Aring, Gelperin and Bean. ³
	(b) Nicotinic acid....	No	Rosenbaum, Piker and Lederer. ¹¹ Jolliffe and Wortis. ¹¹ Wortis and Jolliffe. ¹¹ Spies, Aring, Gelperin and Bean. ³
	(c) Ascorbic acid....	No	Wortis, Wortis and Marsh. ¹¹ Alexander, Pijoan, Schube and Moore. ¹¹
Korsakoff psychosis	Thiamine.....	No	Bowman, Goodhart and Jolliffe. ¹² Jolliffe, Wortis and Fein. ⁶
Muscular dystrophy (some types).....	(a) Alpha-tocopherol	Exp.*	Bicknell. ¹³ Stone. ¹³ Spies and Vilter. ¹³ Donovan. ¹³ Shelden, Butt and Woltman. ¹³ Ferrebee, Klingman and Frantz. ¹³
	(b) Pyridoxine.....	Exp.	Ferrebee, Klingman and Frantz. ¹³ Antopol and Schotland. ¹³ Bakwin. ¹³
Amyotrophic lateral sclerosis (some types)	(a) Alpha-tocopherol	Exp.	Bicknell. ¹³ Spies and Vilter. ¹³ Ferrebee, Klingman and Frantz. ¹³ Wechsler. ¹³ Denker and Scheinman. ¹³
	(b) Pyridoxine.....	Exp.	Shelden, Butt and Woltman. ¹³
Paralysis agitans (some types).....	Pyridoxine.....	Exp.	Jolliffe. ¹⁴ Spies, Hightower and Hubbard. ¹⁵ Zeligs. ¹⁶ Wortis. ¹⁷ Baker. ¹³

* Exp. indicates experimental.

paralysis agitans, and since pyridoxine is involved in muscle metabolism, it seemed worth while to test its effect in this syndrome. I therefore selected 15 patients having paralysis agitans, all of whom were chairfast

months, although he must receive pyridoxine parenterally three times a week for which saline, thiamine or nicotinamide cannot be substituted. The fourth patient has had a regression, so that now the tremors and rigidities are about the same as they were at the start of the treatment.

In reporting on these 15 helpless patients I noted that "thus far objective beneficial results . . . have been limited to the lessening of rigidities and increase in strength in patients whose complete disability was of less than three years' duration." Since then I have treated 46 ambulatory patients having paralysis agitans with pyridoxine, without selection as to age, type or degree of disability within ambulatory limits. Fourteen patients, all of whom showed no improvement, abandoned the treatment in less than three weeks. Shorter trials of therapy, such as recently reported by Zeligs,¹⁶

13. Bicknell, F.: Vitamin E in the Treatment of Muscular Dystrophies and Nervous Diseases, *Lancet* 1:10 (Jan. 6) 1940. Stone, Simon: Treatment of Muscular Dystrophies and Allied Conditions: Preliminary Report on the Use of Vitamin E (Wheat Germ Oil), *J. A. M. A.* 114:2187 (June 1) 1940. Spies, T. D., and Vilter, R. W.: A Note on the Effect of Alpha-Tocopherol (Vitamin E) in Human Nutrition, *South. M. J.* 33:663 (June) 1940. Donovan, G. E.: Lordosis and Muscular Dystrophy, *Lancet* 2:162 (Aug. 10) 1940. Shelden, C. H.; Butt, H. R.; and Woltman, H. W.: Vitamin E (Synthetic Alpha-Tocopherol) Therapy in Certain Neurologic Disorders, *Proc. Staff Meet., Mayo Clin.* 15:577 (Sept. 11) 1940. Ferrebee, J. W.; Klingman, W. O., and Frantz, A. M.: Vitamin E and Vitamin B; Clinical Experience in the Treatment of Muscular Dystrophy and Amyotrophic Lateral Sclerosis, *J. A. M. A.* 116:1895 (April 26) 1941. Antopol, William, and Schotland, C. E.: The Use of Vitamin B in Pseudohypertrophic Muscular Dystrophy, *ibid.* 114:1058 (March 23) 1940. Bakwin, Harry: Personal communication to the author on negative response from pyridoxine therapy in muscular dystrophy. Wechsler, I. S.: Recovery in Amyotrophic Lateral Sclerosis Treated with Tocopherols (Vitamin E): Preliminary Report, *J. A. M. A.* 114:948 (March 16) 1940; The Treatment of Amyotrophic Lateral Sclerosis with Vitamin E (Tocopherols), *Am. J. M. Sc.* 200:765 (Dec.) 1940. Denker, P. G., and Scheinman, Leonard: Treatment of Amyotrophic Lateral Sclerosis with Vitamin E (Alpha-Tocopherol), *J. A. M. A.* 116:1893 (April 26) 1941. Baker, A. B.: The Treatment of Paralysis Agitans with Vitamin B (Pyridoxine Hydrochloride), *ibid.* 116:2484 (May 31) 1941. Jolliffe.¹⁴ Spies, Hightower and Hubbard.¹⁵ Zeligs.¹⁶ Wortis.¹⁷

14. Jolliffe, Norman: Clinical Aspects of Vitamin B Deficiencies, *Minnesota Med.* 23:542 (Aug.) 1940.

15. Spies, T. D.; Hightower, D. P., and Hubbard, L. H.: Recent Advances in Vitamin Therapy, *J. A. M. A.* 115:292 (July 27) 1940.

16. Zeligs, M. A.: Use of Pyridoxine Hydrochloride (Vitamin B) in Parkinsonism, *J. A. M. A.* 116:2148 (May 10) 1941.

who gave "daily doses of 50 to 100 mg. (repeated one to three times)" intravenously, are entirely inadequate for judging this form of therapy. The group of 32 patients who continued the treatment longer than three weeks, of whom 23 were economic cripples, has

TABLE 2—*Ambulatory Patients with Paralysis Agitans: Pyridoxine Treatment for Three Weeks or More*

Group	Number	Improvement				Continuing Therapy
		None	Subjective	Objective	Return to Work	
Arteriosclerotic	6	5	1	0	0	1
Postencephalitic	10	4	6	4	2	6
Idiopathic	16	10	6	2	1	7
Total	32	19	13	6	3	14

shown, I believe, worth while results (table 2). The most conservative estimate of improvement would be to take as a criterion the 10 per cent who showed economic rehabilitation (one as a farm hand, one as a clerk in a vegetable market, the third as an insurance

psychiatric patients to whom specific therapy is to be given are therefore placed on the following regimen:

1. A full, nutritious diet of natural unrefined foods. To accomplish this, all vitamin-free or vitamin-poor foods are excluded from the diet. (These include sugar, candy, jellies, jams, white flour products, refined cereals, polished rice and alcoholic drinks). The patient is instructed to eat each day citrus fruit juices or tomato juice 360 cc., milk 720 cc., meat (including frequent servings of liver or pork muscle) 250 Gm., eggs 2, butter 45 Gm., salad (raw vegetables and fruit) 250 Gm., salad oil 15 cc. and potatoes 250 Gm. The balance of the diet is selected by the patient from cooked or raw vegetables, cooked or raw fruits, whole grain cereals and whole grain bread.

2. Vitamin supplements by mouth. Routinely the patients are given a fish liver oil in an amount containing 10,000 units of vitamin A and a source of the entire vitamin B complex. Such products as 30 Gm. of brewers' yeast, 20 Gm. of vegex, 45 cc. of aqueous liver extract or 60 Gm. of wheat germ cereal are preferred to synthetic products in capsule form from which

TABLE 3—*Specific Treatment of Neuropsychiatric Disorders with Vitamins*

Disease or Syndrome	Vitamin	Amount in Mg	Route	Frequency	Comment
Neurasthenic	Thiamine Nicotinic acid amide	10 to 30 100 to 300	Parenteral Mouth	Daily Daily..	Trial of at least 3 weeks if less than 3 months' duration, if of longer duration trial of at least 3 months
Polyneuropathy					
Mild	Thiamine	10 to 30	Parenteral	Daily.	10 days to 3 weeks
Moderate	Thiamine	20 to 50	Parenteral	2 times daily	3 to 6 weeks
Severe	Thiamine	20 to 100	Parenteral	2 times daily	3 to 6 weeks then in smaller doses until well after improvement ceases
Ophthalmoplegia of Wernicke's syndrome	Thiamine	50 to 100	Parenteral	3 times daily	2 to 7 days
Pellagra psychosis	Nicotinic acid	300 to 1,000	Mouth	Daily	1 to 4 weeks then continue smaller doses until complete recovery
Nicotinic acid deficiency, encephalopathy	Nicotinic acid Nicotinic acid amide	500 to 1,000 100 to 200	Mouth Parenteral	Daily Daily	3 to 7 days 3 to 7 days then continue smaller doses by mouth through convalescence
Muscular dystrophies	Pyridoxine	50 to 100	Parenteral	Daily	Trial of at least 3 months
Paralysis agitans	Pyridoxine	50 to 100	Parenteral	Daily	Trial of at least 1 month
Amyotrophic lateral sclerosis	Alpha tocopherol	150 to 200 100 to 150	Mouth Parenteral	Daily.. Daily	Trial of at least 3 months

broker). A less conservative estimate would be the 20 per cent who showed objective improvement. A far too liberal estimate would be the 40 per cent who show subjective improvement and are still willing to continue treatment that involves travel and parenteral administration. One of my associates¹⁷ has studied 12 cases of long-standing parkinsonism (average duration ten and one-half years) and noted no beneficial results from adequate pyridoxine therapy.

The fact that the improvement in helpless patients previously reported on was limited to those with the idiopathic and arteriosclerotic types of the condition, while in the ambulatory series reported here improvement seems more frequent in the postencephalitic group, indicates that the entire series is still too small to allow definite conclusions to be drawn. It seems justifiable to say, however, that the syndrome of paralysis agitans, if not of too long duration, appears to include cases which are helped by pyridoxine.

Nutritional treatment of neuropsychiatric disorders consists of (1) general measures applicable to all and (2) specific therapy. The principles on which the general treatment is based are (a) that deficiency disease in man is usually not single but multiple and (b) that therefore adequate treatment does not consist of the administration of specific chemicals (crystalline vitamins), whether singly or in combination. All neuro-

some factors as yet impossible to encapsulate are likely to be missing.

3. Parenteral administration of the entire vitamin B complex. This practice is based on the empirical observation that these patients seem to do better when at least a quantity of the entire B complex is given parenterally. It is especially important when absorption or utilization of the vitamins may be impaired. I use as a routine 2 or 3 cc. of crude liver extract or liver residue as a vehicle for the specific vitamin prescribed and continue it as long as vitamins are administered parenterally. If injections are long continued local soreness may make it advisable to substitute for liver extract synthetic vitamins that can be given either intravenously or intramuscularly. For this purpose I use thiamine hydrochloride 10 mg., riboflavin 1 mg. and nicotinic acid amide 100 mg.

These disorders are complicated at times by gastrointestinal or other disturbances which prevent this routine from being followed. The diet may then be modified to meet the individual requirement, as much as possible of its nutritive qualities being retained. The vitamin A is increased to 20,000 units; in place of the bulky sources of the B complex crystalline vitamins are given twice daily in the following amounts: thiamine 25 mg., riboflavin 3.75 mg., nicotinic acid amide 25 mg., and 200 mg. of ascorbic acid is given in two doses.

¹⁷ Wortis, Herman. Personal communication to the author

Specific treatments recommended in table 3 are based on the principle that when biochemical or reversible anatomic lesions are present it is safer to err on the side of wasting the vitamin than to give too little for too short a period of time. If the patient has liver disease or diarrhea or is an alcoholic addict, the larger doses recommended in the table should be given. Clinical as well as experimental evidence indicates that in these conditions much larger doses of vitamins are required to produce maximal response than when absorption is unimpaired and the liver normal.

In view of recent expressions concerning toxic effects of vitamins, I believe it pertinent to state that in treating more than 3,000 patients with clinically manifest deficiency disease I have not observed any toxic effects when the vitamins were administered as a crystalline vitamin dissolved in saline solution without added preservatives, in the doses described, and while the patient was maintained with a good diet and the entire vitamin B complex (except, of course, the vasomotor phenomena of nicotinic acid). Drs. Borsook, McLester, Sebrell, Spies and Sydenstricker have informed me that their experiences have been similar. Dr. Borsook has administered by intravenous injection to each of 70 patients for at least three years 100 mg. of thiamine hydrochloride daily (except on Sundays and holidays) without observing any signs of toxicity. I have observed, however, local and general sensitivity to solutions of thiamine containing added preservatives. Cutaneous tests performed on these patients demonstrated sensitivity to the preservative and not to the thiamine. Subsequent administration of crystalline thiamine dissolved in saline solution was in no instance followed by either local or general sensitivity in the same patients. Two patients who were maintained with dextrose, saline solution and large doses of nicotinic acid and 4 patients who were maintained with a poor diet plus dextrose, saline solution, crystalline B vitamins in maintenance doses and large doses of nicotinic acid may possibly have manifested signs of nicotinic acid toxicity. I believe, however, that in these subjects deficiency of other vitamins is the more likely explanation.

CONCLUSION

No untoward effects have been observed after the therapeutic administration of any of the crystalline B vitamins to more than 3,000 patients.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRs. RUFFIN AND JOLLIFFE

DR. F. P. MOERSCH, Rochester, Minn.: We should be guided in our enthusiasm regarding vitamin therapy by the results obtained by careful leaders. As pointed out by Dr. Ruffin, overenthusiasm leads to confusion. The challenge that is being hurled at the indiscriminate users of vitamins in various neurologic disorders is unfortunate but may be justified. As the authors have stated, the so-called neurasthenic syndrome is probably one of the earliest and one of the most frequent manifestations of deficiency of both thiamine hydrochloride and nicotinic acid. Unfortunately, the clinical differentiation between the neurosis termed neurasthenia and the neurasthenic syndrome resulting from a vitamin deficiency is difficult. At the present time there is no simple laboratory method to aid us in this differentiation. To give the patient presenting a neurasthenic syndrome the benefit of doubt, vitamin therapy can be employed for a short period of time. If there is no prompt response to the treatment, it should be discontinued. If improvement does occur, the possibility of psychotherapy playing a role in the improvement must be weighed carefully. It may be advisable

to avoid the term neurasthenic syndrome in connection with vitamin deficiency and employ some term such as vitamin asthenia to differentiate the condition from a purely functional disorder. Dr. Jolliffe deserves credit for being among the first to recognize the syndrome which he described as nicotinic acid deficiency encephalopathy. My own experience with this condition is rather limited. This is probably the result of our type of patients and partly of our failure to recognize the syndrome always. In this connection Dr. Snell and Dr. Butt, under the heading of "hepatic coma," have described a syndrome which has many of the features of nicotinic acid deficiency encephalopathy and which responds in dramatic manner to the administration of large quantities of dextrose with thiamine and nicotinic acid. Dr. Jolliffe is cautious in his statements regarding the value of vitamin therapy in the dystrophies and in amyotrophic lateral sclerosis. When such unrelated diseases as progressive muscular dystrophy, amyotrophic lateral sclerosis, multiple sclerosis and tabes dorsalis are placed in the same category and considered as examples of vitamin E deficiency, one has cause to stop and wonder. Our results in the treatment of these conditions by administration of various vitamins have been uniformly unsatisfactory. Our treatment of paralysis agitans with pyridoxine has also been discouraging.

DR. I. S. WECHSLER, New York: I am in some measure guilty of introducing vitamins in the treatment of neuropathies—not neuritis—and of other "degenerative" diseases of the nervous system. Absence of vitamins does not result in inflammation of nerve tissue either peripheral or central. No pathologist has ever demonstrated inflammatory changes in vitamin deficiencies. The word degeneration at best is a challenge, at worst meaningless. Many of the pathologic changes due to avitaminosis are reversible, the degree depending on the duration and extent of the privation. Negative results are not nearly so important as positive ones. There seems to be a certain specificity about vitamins, both as regards deficiencies and as regards therapeutic values. However, an apparent contradiction to this is that, while avitaminoses are specific, they are not usually isolated or unitary. Therefore, while the caution against "shotgun prescriptions" is correct, treatment with one vitamin alone is not always adequate. Vitamins, if effective, generally act rapidly. If results are not obtained within a reasonable period of time, there is no point in continuing treatment for months or years. As to so-called degenerative diseases of the central nervous system, such as multiple sclerosis or amyotrophic lateral sclerosis, I feel that they represent multiple syndromes of varying etiology. It is quite probable that only one of the syndromes is the result of vitamin deficiency, and therefore only isolated cases may be expected to respond to treatment. In view of the criticism leveled at clinical studies of avitaminoses, it may be well to recall that science does not consist alone in looking into test tubes. An accurate clinical observation honestly recorded is just as scientific as a laboratory experiment. Only a small proportion of a large number of cases of amyotrophic lateral sclerosis have responded to treatment with vitamin E. I do not now claim nor have I ever said that vitamin E cures the disease. Perhaps the worth of the studies will lie in the new approach to "degenerative" diseases. Our investigations have led to the perfection of a method for the determination of the tocopherol (vitamin E) level in the blood. The test may now be used in the study of normal persons, of patients ill with the disease, of the rate of absorption, of the relative therapeutic value of oral versus parenteral administration and of many other problems.

DR. C. A. MILLS, Cincinnati: I shall speak regarding two phases of vitamin therapy. One deals with sharp differences in optimal requirements at high and low temperatures and the other with thiamine overdosage and toxicity. In our laboratories at Cincinnati we have found that the thiamine requirement per gram of food for rats is twice as high at 91 F. as at 65 F. Preliminary studies have indicated a similar difference for pantothenic acid and pyridoxine. Last February and March I found that Panama residents were living under the same thiamine deficiency as my hot room laboratory animals. Using the thiochrome method for urinary thiamine excretion, I found most people on native foods to be excreting under 100 micrograms a day. It took six to eight days of thiamine feed-

ing (3 mg. a day) before this excretion rate rose above 1,000 micrograms a day, indicating a tissue saturation which I myself reached within one day at this dosage. Tropically grown meats seem to be deficient in thiamine, for test feedings with Panamanian pork loin gave much lower excretion rates than did those with pork imported from the United States. Tropical people seem doubly handicapped with respect to the B vitamins. Their requirements are higher and their supply more deficient than those of people living in cooler climates. These facts may help to explain the greater prevalence of B vitamin deficiency states in populations living under tropical or sub-tropical warmth. While in Panama my attention was called to repeated instances of thiamine toxicity. Many patients showed hyperthyroid-like symptoms—nervousness, insomnia, headache, tremor, rapid pulse, rise in blood pressure, emotional instability, nausea and sometimes vomiting. Since returning to Cincinnati I have come across even more severe thiamine reactions, with one death and several near-fatal collapses. These severe reactions all resulted from intramuscular thiamine injections in 10-50 mg. doses and seemed definitely allergic in character. In the one death, autopsy showed multiple ecchymoses beneath the pia over both cerebral hemispheres, with areas of encephalomalacia and perivascular hemorrhage. Dr. Leon Schiff witnessed one of these reactions and has consented to describe it briefly. Thiamine is very soluble and easily absorbable, with a normal daily requirement of about 2 mg. The medical profession might well bring the doses used down nearer this physiologic requirement, abandoning the 10 to 500 mg. dosages and the injection route of administration.

DR. MEYER ZELIGS, Cincinnati: Dr. Jolliffe has handled effectively the matter of general vitamin intake. His dietary regimen, comprising abundant foods rich in natural vitamins, plus the administration of known synthetic compounds—such as thiamine, riboflavin and nicotinic acid—constitutes an excellent method of assuring an adequate polyvitamin level in all patients under study. The addition to that regimen of specific synthetic fractions, such as pyridoxine or alpha-tocopherol, makes it easier to control such a study. When Dr. Jolliffe reported beneficial results with the use of vitamin B₆ in paralysis agitans, it was stated that within a few minutes there occurred much improvement, rigidity was decreased significantly and the patients were able to walk without the usual stiffness. It was on the basis of this report that I was moved to try the same form of therapy. Accordingly, a group of 15 patients with parkinsonism were selected, 10 of whom had the post-encephalitic and 5 the arteriosclerotic type. Repeated daily doses of 100 mg. were administered intravenously to this group. This series of patients constituted an especially fitting one for such a study, since all of them had previously been under my observation for a period of six to eighteen months. Improvement could therefore be accurately evaluated by comparison with the previous condition of the entire group. Moreover, particular care was taken to avoid suggestive comment at the time of injection or thereafter, so that the psychologic effect of a "new" medicine would not be a factor in the therapeutic result. No change whatever was observed in the entire group. According to Dr. Jolliffe's communication, the duration of treatment has been lengthened to a period of at least four weeks, during which intravenous treatments with B₆ were given. This differs from his earlier reports, in which improvement was noted in a shorter time. I intend repeating this study and shall extend the duration of treatment over a longer period of time. I hope that I may be able to report something more encouraging at a later date.

DR. LEON SCHIFF, Cincinnati: I want to relate the experience to which Dr. Mills referred. This concerned a white school teacher, aged 45, with mild Raynaud's disease, hypertrophic arthritis and sciatica, who had during the course of eight months received fifty-seven injections of thiamine hydrochloride solution in doses of 25 mg. The injections were given intramuscularly. Three different commercial preparations were used in an attempt to avoid the nausea and vomiting which followed some of the injections. About a minute or two after her fifty-eighth injection she became nauseated, vomited, voided involuntarily and collapsed. Respiration ceased; she became pulseless, and I thought that she was dead. We immediately

instituted artificial respiration, gave epinephrine hydrochloride intravenously and employed other measures used in shock, and the patient eventually recovered. She told us later that following the last three or four injections of the thiamine hydrochloride solution she had had some sneezing. Intradermal scratch tests done with two of the commercial preparations, including the one which induced the reaction, were strongly positive. It so happened that there was a different preservative in each of these two preparations. She was then tested with the preservatives, and the results were negative. She was tested with an aqueous solution of thiamine hydrochloride crystals on two different days and on both occasions gave a strongly positive test. The rapidity with which the systemic reaction occurred indicates that some of the thiamine hydrochloride solution may have entered a vein, although care had been exercised to give it intramuscularly. While this experience may be rare, it nevertheless makes us believe that skin testing patients who are about to receive thiamine hydrochloride solution intravenously may be a wise precautionary method.

DR. THOMAS T. MACKIE, New York: I have taken the liberty of requesting this opportunity of adding more emphasis to the thesis which Dr. Ruffin presented, and particularly with reference to the too strict interpretation of particular physical signs or symptoms as indicative of specific deficiencies. At a meeting some ten days ago of a group of us working in this field, it immediately became apparent in the discussion that those coming from different parts of the country associated different physical signs with different vitamin deficiencies. If one correlates with that what is certainly true in certain areas of this country, that there are fundamental variations in the type of diet which the people customarily ingest, the conflict is not as serious as it might appear to be superficially. Particularly is that true when one appreciates the present concept of the physiologic action of these specific food factors and their important relationship to the oxidation-reduction systems in intracellular metabolism. Furthermore there has developed not only this difference of opinion as to the specificity of physical signs but likewise a similar difference of opinion as to specificity of therapy. For example, the lesions in the nasal labial fold which are ascribed to ariboflavinosis respond in certain instances to the exhibition of nicotinic acid. The same situation applies to certain of the other factors as well. It is important, therefore, to realize that there may be a fundamental interrelation between these different substances of such a nature that the administration, let us say, of riboflavin to one individual will permit a sufficient restitution toward normal of intracellular metabolism to give an obvious therapeutic response, but that does not necessarily mean that the therapeutic response observed following the administration of a single crystalline substance is, strictly speaking, a true reaction to that particular material.

DR. NORMAN H. JOLLIFFE, New York: Dr. Moersch inquires regarding my experience with nicotinic acid deficiency encephalopathy in liver diseases. I have had the opportunity of seeing about half a dozen instances of this deficiency encephalopathy in patients having cirrhosis of the liver. This experience duplicates that of Snell and Butt as reported at the recent meeting of the Association of American Physicians. Dr. Zelig pointed out his negative results with pyridoxine in paralysis agitans. I too can record a much larger series of negative results. As pointed out by Dr. Wechsler in the discussion and by me in my presentation, paralysis agitans is a syndrome consisting, in all probability, of several disease entities. A positive response in but few patients is more significant than negative responses in many patients. Dr. Zelig gave daily doses of 50 to 100 mg. repeated one to three times. I do not believe an evaluation of therapy can be made, even provisionally, prior to three weeks of treatment. The treatment that I employed has been modified only in that this period of trial has been extended to four weeks. I wish to point out to Dr. Zelig that the quotation, which he attributed to me, that "within a few minutes there was much improvement, rigidity was decreased significantly, and the patients were able to walk without their usual stiffness" appears nowhere in any of my published papers. Neither have I in a presentation before a society made this statement, even in the singular. Concerning the toxicity of the vitamins, it seems to me that the symptoms mentioned by Dr. Mills and

by Dr. Schiff are not those of toxicity but those of abnormal sensitivity. I believe any allergist would not hesitate so to label them and give epinephrine with full confidence in its efficacy. Proprietary preparations of vitamins when marketed in rubber capped vials suitable for several doses always contain a preservative. This preservative, for vitamins, is usually chlorobutanol. The two patients I have observed who showed these abnormal reactions to injections of vitamins were proved to be sensitive to the preservative and not to the vitamins. First, this was shown by skin tests, and second the administering of vitamins without added preservatives gave no symptoms.

THROMBOPHLEBITIS AND PULMONARY EMBOLISM

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Intravascular complications of surgical operations are common and, to a great extent, mysterious. Too often phlebitis is regarded simply as a nuisance and embolism as an act of providence. Yet the courses of these complications, and their relationships as well, are uniform enough in many cases to indicate the value of certain procedures designed either to prevent the disease or to treat it after it has developed.

Many problems present themselves immediately. Some of them are highly theoretical, others are entirely academic, but many are extremely practical. Unfortunately, even the most practical aspects must be based to a large extent on theory, because direct investigations of intravascular disorders and physiology are rare. This study has avoided as much theory as possible and has been elaborated about one central problem—the development of therapeutic guides.

To establish a comprehensive background, a survey was first made of 250 cases of thrombophlebitis of the lower extremities observed in the Massachusetts General Hospital during the five year period 1935-1939. A high proportion of these cases was seen by one or more members of the peripheral vascular clinic. From this group of cases a number of significant conclusions was drawn and unsolved problems specified. During the past two years we have attempted, as far as possible, to clarify these special points.

At the outset, we were concerned chiefly with these questions:

1. What laboratory measures or other clinical tests may be employed to diagnose phlebitis or to indicate when the disease has ceased?
2. What is the clinical course of a patient with uncomplicated thrombophlebitis treated by various methods?
3. In how many patients with phlebitis do pulmonary emboli develop and in which patients are they likely to occur?
4. Is there any therapeutic measure that will prevent the occurrence of emboli?

As far as possible, these questions will be answered.

PREVENTION

The prevention of phlebitis is, of course, a primary consideration but, as far as this study is concerned, only incidental. Here we are dealing chiefly with postoperative phlebitis. There is little new to add to this

problem. Careful attention must be paid to correct any abnormalities such as cardiac failure, electrolyte imbalance and anemia. Varicose veins should be ligated preoperatively or controlled by compression bandages thereafter. Postoperatively, stasis of the blood stream must be avoided. This is promoted by frequent active movements of the legs in bed. It is not sufficient to have the patient get out of bed at an early postoperative date, for too frequently he will merely stand still, produce a static column of blood in the leg and increase the chances of thrombosis. Elevation of the foot of the bed during the early postoperative period will keep the veins of the calves relatively empty and prevent stasis in this important region.

Other measures to prevent thrombosis are of importance. The most recent has been the postoperative administration of heparin. Bancroft¹ has suggested the use of sodium thiosulfate intravenously, and also diets low in protein in an effort to diminish the clotting factors. We have used the thiosulfate occasionally, with no striking results, as far as dissolution of a previously existing thrombosis is concerned. The protein in the blood stream is lowered with such difficulty and only after such protracted periods that it has hardly seemed wise to persist with this special diet. The postoperative use of thyroid to speed the pulse, and thereby prevent stasis, was tried extensively in this clinic for a year without any clear-cut conclusions and seems to us to possess no definite merit.

DIAGNOSIS

Ochsner² has distinguished between "thrombophlebitis," with its clear-cut signs of intravascular inflammation, and "phlebothrombosis," in which tenderness is slight and the temperature only slightly elevated. Theoretically, the diseases should behave differently. The ultimate results of the former should include more edema and more postphlebitic ulcers, while pulmonary emboli should be more common in cases of phlebothrombosis, in which the clot is not firmly anchored to the wall of the vein by inflammatory changes.

Practically, however, there are all gradations from the clearly purulent thrombophlebitis to pure thrombosis in which temperature, sedimentation rate and white count are all normal. Moreover, they all have in common the one most important dangerous characteristic—the tendency to extend proximally within the lumen of the involved vein.

While a few cases can clearly be defined as either phlebothrombosis or thrombophlebitis, the majority are equivocal. The term "thrombo-embolic disease," employed by many of the continental surgeons, emphasizes the essential similarity of these two types. We have found it impossible to attempt a definite separation but have called all cases of intravascular inflammation or thrombosis by the admittedly loose term "phlebitis." It is important to recognize, however, that the more closely the symptoms and signs approach to those of true phlebothrombosis, the more dangerous is the situation.

It has been found to be much more important to locate the area of the vein involved in the pathologic process. For all practical purposes, this means that either the deep or the superficial veins should be specified as the site. Frequently deep phlebitis extends to involve portions or all the superficial systems, while the reverse is occasionally true. We have proved on

Owing to lack of space, this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.

Read before the Section on Surgery, General and Abdominal, at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 3, 1941.

1. Bancroft, F. W.; Stanley-Brown, Margaret, and Quick, A. J.: Postoperative Thrombosis and Embolism, Tr. South. S. A. 47: 434, 1935.
2. Ochsner, Alton: Thrombophlebitis, Surgery 6: 129, 1939.

the operating table that many cases in which the only obvious involvement is of the superficial veins present a thrombosis of the deep veins as well.

Clinical differentiation is therefore often difficult. Superficial phlebitis is easy to diagnose by the presence of tender subcutaneous thrombi along the course of the saphenous vein, but the detection of deep phlebitis may be hard. The importance of the diagnosis of deep phlebitis is exactly in reverse ratio to the ease with which it can be made. Meticulous examination as that followed by Culp³ may show slight swelling of one leg or slight tenderness in the calf. Homans'⁴ test of pain in the calf on forcible dorsiflexion of the ankle is occasionally positive when other signs are absent. Edema of the lower leg usually signifies thrombosis of the popliteal and lower portion of the femoral vein, while edema of the thigh indicates that the thrombosis extends at least as high as the external iliac vessels.

Laboratory studies are disappointing. The white count is extremely variable and undependable as far as diagnosis is concerned. We have formerly laid considerable stress on the sedimentation rate. It has also been capricious, varying from an extremely rapid to an unusually slow fall. About the only significance that can be attached to either the white count or the sedimentation rate is that a return to a normal level accompanies improvement in cases of true thrombophlebitis.

We have, in a series of cases, measured the circulation time of the blood in the legs by the method of Weiss and Robb,⁵ in the hope that the time would be longer than normal if deep thrombosis was present. End points have not always been clear, and we have found the method unreliable.

It was therefore with great relief that we found the method of venography developed by Dos Santos⁶ and elaborated by Bauer⁷ and others⁸ to be a valuable guide. We have come to place great reliance on the venogram. It must be made with an exact technic, and the reader must have some familiarity with the venographic picture in order to interpret it correctly. After some experience, it becomes simple to obtain and is an accurate guide. There are cases, however, in which the thrombosis is early and localized in the calf and in which clinical signs precede a positive venogram.

Quantitative measurements must be made in order to evaluate the severity of an attack of phlebitis and to determine when it has ceased. The amount of pain, of edema or of associated arterial spasm all offer means of comparison. Yet, for practical purposes, they are all difficult to estimate in a comparative fashion. Other ways are furnished by the number of days that a patient is kept in bed or in the hospital after the onset of the attack. Yet these figures will vary tremendously, depending on totally extraneous factors, such as the conservatism of the surgeon in charge or on the amount of crowding in the hospital beds. One criterion that we consider valuable is the duration of elevation of temperature. This is also a method of limited significance, since in occasional cases there is no accompanying elevation of temperature. A second criterion is the occur-

rence of pulmonary emboli during the acute phase, and a third, the persistence of chronic edema. As far as the first two considerations are concerned, the comparison is easy. The third is extremely hard to evaluate because these patients are difficult to trace accurately. It seems that until it is possible to present careful follow-up studies the behavior of the phlebitis during the acute stage must constitute the basis for any comparison of results.

What, then, may one learn concerning the length of disability and the occurrence of emboli as far as phlebitis is concerned? Superficial phlebitis will first be discussed briefly because the treatment of deep phlebitis has developed logically from the same considerations.



Fig. 1.—Differentiation of superficial and deep thrombophlebitis: A, normal venogram; B, venogram of a patient after operation who clinically had only superficial thrombophlebitis. Note lack of filling of the femoral vein in the venogram. Immediate ligation of the superficial femoral vein with removal of the thrombus. Recovery without embolic manifestations.

SUPERFICIAL PHLEBITIS

This may occur spontaneously, after direct trauma or after operation. If it originates from an infected ulcer or laceration, the phlebitis may be purulent. Usually, however, cultures of the clot will be negative. In any case, we believe that the best therapeutic procedure consists of ligation and division of the involved saphenous vein at its junction with the femoral or popliteal, as the case may be.

Ligation is urged for three reasons. 1. If the thrombosis is allowed to progress without treatment there is a tendency for the clot to progress proximally. The thrombus finally extends into the deep system of veins and may result in a thrombosis of the femoral vein. This may be prevented by section of the saphenous vein.

3. Culp, O. S.: Postoperative Venous Thrombosis and Pulmonary Embolism, *Bull. Johns Hopkins Hosp.* 67:1, 1940.
4. Homans, John: Exploration and Division of the Femoral and Iliac Veins in the Treatment of Thrombophlebitis of the Leg, *New England J. Med.* 224:179, 1941.
5. Robb, George, and Weiss, Soma: A Method for the Measurement of the Velocity of the Pulmonary and Peripheral Venous Blood Flow in Man, *Am. Heart J.* 5:650, 1933.
6. Dos Santos, J. C.: Direct Venography: Conception, Technique, First Results, *J. internat. de chir.* 3:625, 1938.
7. Bauer, Gunnar: A Venographic Study of Thrombo Embolic Problems, *Acta chir. Scandinav.*, 1940, suppl. 61.
8. Dougherty, John, and Homans, John: Venography: A Clinical Study, *Surg., Gynec. & Obst.* 71:697, 1940.

2. There is also no doubt but that pulmonary emboli may originate from thrombi in the saphenous systems alone. These cases are not common. One patient included in this study had had three pulmonary infarcts until a partially thrombosed saphenous vein, in which a loose clot was found at operation, was tied. Barrow⁹ has reported a fatal embolus arising from a saphenous vein, while Nobl¹⁰ has stated that 0.5 per cent of all fatal emboli originate from the saphenous veins.

Finally, after ligation, it is possible and even desirable to make the patient immediately ambulatory, because the dangers of extension of thrombosis and further embolic manifestations are minimized. Unless there are other reasons for keeping him in the hospital, the patient is discharged the day after ligation has been performed.

DEEP PHLEBITIS

The problem of deep thrombophlebitis, however, is much more complicated than that of superficial phlebitis, and the therapeutics are correspondingly of more importance. Emboli are much more common and more serious. The well known sequelae of phlebitis—edema and ulcer—follow deep, rather than superficial, phlebitis.

Deep phlebitis may occur in the postoperative patient. It may follow direct or indirect trauma to the leg. It occurs spontaneously without any clear predisposing cause in many cases during the course of certain fevers or appears as an acute exacerbation in a leg previously the site of a phlebotic process.

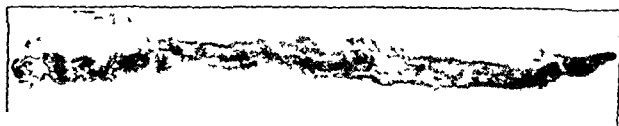


Fig 2—Specimen of loose thrombus removed from the iliac vein by means of the Trendelenburg suction apparatus introduced through the superficial femoral vein. The patient had had a nearly fatal embolus before operation and none thereafter.

There may be some question as to whether all these types of phlebitis are similar enough to be grouped together. There does appear to be evidence that they are essentially alike. The duration of the disease, judged by the period of elevation of temperature, is essentially the same in the various types. The incidence of emboli is also remarkably constant in the different groups. Thus 17 out of 58 postoperative cases of deep phlebitis, 3 out of 10 traumatic cases and 14 out of 42 of the remaining cases presented emboli. The incidence of emboli to deep phlebitis in all these groups is very close to 1 in 3. Because of these similarities, all cases of deep phlebitis have been grouped together.

The most important feature to be discussed is the problem of pulmonary emboli. The length of stay in the hospital and the occurrence of late sequelae would be of little moment if emboli could be prevented. The importance of this aspect is shown by the high incidence of pulmonary emboli with deep phlebitis; 1 out of 3 patients has an embolus and 1 out of 25 will have a fatal embolus. The death rate is almost the same as that found by Miller and Rogers¹¹ in an earlier series of cases of phlebitis in this clinic, i. e. 7 deaths among 206 patients.

9 Barrow, D. W. Fatal Pulmonary Embolus from Superficial Thrombophlebitis, *Ann Surg* 110: 1118, 1939.

10 Nobl, G. Prevention of Varicose Thrombophlebitis, *Wien klin Wchnschr* 49: 240, 1936.

11 Miller, R. H., and Rogers, Horatio. Postoperative Embolism and Phlebitis, *J. A. M. A.* 93: 1452 (Nov. 9) 1929.

Pulmonary emboli vary tremendously in size and clinical symptoms. Massive pulmonary emboli, producing death immediately or within twenty-four hours, are relatively rare. We have been able to collect 123 proved cases from the Massachusetts General Hospital¹² in a thirteen year period. As far as therapeutics

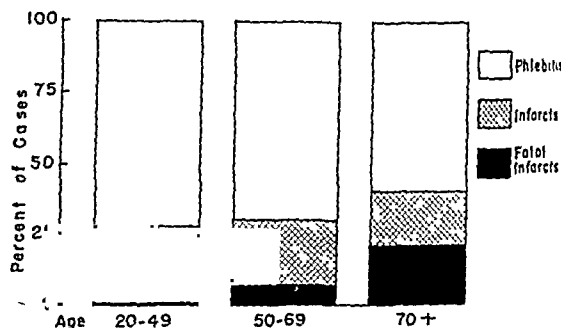


Fig 3—Incidence of deep thrombophlebitis of the legs and pulmonary infarcts with conservative therapy, according to age.

is concerned, the number of massive emboli associated with clinical phlebitis is unfortunately small (55 per cent in this series).

Clinical appreciation of thrombosis of the veins of the lower extremities has often been sluggish. Autopsy has often been of no value because the veins of the legs have not been examined. When this has been done, it is apparent that the large fatal emboli usually originate from the large veins of the lower extremities. Prettin¹³ found that 133 out of 144 fatal emboli originated from the region drained by the inferior vena cava. Ninety-one of the patients had involvement of the femoral or iliac veins. Hampton and Castleman¹⁴ have observed that "a very large percentage of emboli arise from symptomless thrombosis of the deep veins of the legs, usually in the popliteal region."

Formerly the uterine and the prostatic plexus were regarded as sources of fatal emboli. Castleman¹⁵ believes that this view is incorrect. He states that, with the exception, of pulmonary emboli originating from

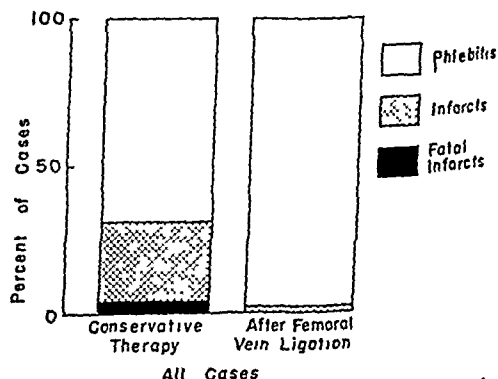


Fig 4—Incidence of embolism with thrombophlebitis of the leg after conservative therapy and after ligation of the femoral vein.

the heart, 95 per cent of all fatal emboli arise from the veins of the lower extremity, i. e. from the veins of the calf to the ilia. This is attested by the fact that

12 Faxon, H. H., and Welch, C. E. Massive Pulmonary Embolism to be published.

13 Prettin, Fritz. Thrombosis and Fatal Pulmonary Emboli, *Virchows Arch f. path. Anat.* 297: 535, 1936.

14 Hampton, A. O., and Castleman, Benjamin. Correlation of Post-mortem Chest Teleroentgenograms with Autopsy Findings, *Am. J. Roent.* 42: 305, 1940.

15 Castleman, Benjamin. Personal communication to the authors.

he has found the source of the emboli to be in the legs in all but 2 cases in which he has done an autopsy.

Reduction in the incidence of pulmonary emboli will therefore require increasing attention to the veins of the lower extremities.

In contrast with the massive emboli, very small pulmonary emboli are extremely common, as Hampton and Castleman have proved. Many of them are subclinical in their symptomatology. Between these two classes of emboli are all others, not large enough to cause death yet enough to produce clinical symptoms and increased disability. The source of these emboli is not always clear but it seems likely, from autopsy studies of those patients who have succumbed to a massive embolus, that the minor emboli usually arise from the deep muscular veins of the calf.

There are several methods of treatment that may be employed. Each of them requires some discussion. The first, a time-honored method, consists of elevation of

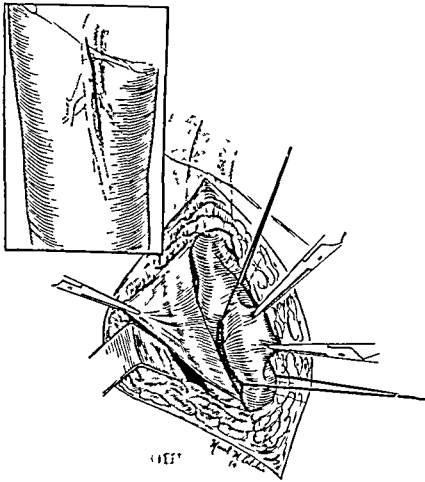


Fig. 5.—The superficial femoral vein is exposed, and control guy ligatures are passed above and below the site in which the vein is to be opened

the leg on one or two pillows, the continuous application of hot wet packs to the entire leg, and administration of sedatives if pain is an important feature. Care must be taken that the packs do not become cold, for vasospasm is likely to be prominent in legs that are cold and damp. For this reason, a lighted cradle is often more satisfactory. Prolonged bed rest does not guarantee freedom from the danger of fatal embolus, although it is much safer than early mobilization.

Sympathetic block involves the repeated blocking of the sympathetic nerves by injection of procaine hydrochloride about the lumbar ganglions according to the method of Leriche,¹⁶ and more recently popularized by Ochsner and deBakey.¹⁷ The theory developed by the latter authors is that a localized area of thrombophlebitis initiates a state of vasospasm throughout the involved extremity. The flow of blood is therefore reduced, metabolites collect in the tissues and edema develops. The theory seems tenable; certainly in the worst cases of thrombophlebitis almost pulseless extremities develop. It is stated that vasospasm, unrelieved by heat, will respond rapidly to injection of procaine hydrochloride. It must be injected repeatedly until the phlebitis has subsided.

Whether or not injection of procaine hydrochloride will diminish the number of pulmonary emboli associated with phlebitis is not clear. We have treated too few patients to be sure. Ochsner and deBakey report only 1 pulmonary infarct found in a series of 19 patients treated by this method. This may be partially explained by the fact that patients with active thrombophlebitis and fever are less apt to have emboli than those with phlebothrombosis, who have relatively little inflammatory reaction to anchor the clot to the venous wall.

Another method that has been developed is that of treatment with heparin. Murray¹⁸ has been extremely optimistic as far as this method is concerned. Heparin will not dissolve previously existing white thrombi but will prevent the extension of any thrombosis and, according to Bauer,⁷ will dissolve early red thrombi. Consequently, if heparin is instituted immediately after operation, patients should be expected to remain free of thrombosis. However, if phlebitis has already begun, there seems to be considerable doubt whether heparin could prevent the occasional dislodgment of an embolus.

Nor is there any reason why a thrombus should not develop on the basis of a preexisting phlebitis as soon as heparin therapy has been stopped.

One case is of considerable interest in this respect. A man aged 26 had a perfectly normal convalescence following an appendectomy until the eighth day, at which time he had a severe pulmonary embolus. Heparin therapy was immediately begun and was continued for ten days. No more embolic manifestations occurred, so heparin therapy was discontinued. Twenty-four hours later there was a well defined deep phlebitis involving the entire left leg. In another case, a pulmonary infarct was followed immediately by a fourteen day treatment with heparin. Shortly after the treatment ceased a fatal pulmonary embolus developed.

One other patient, given heparin after a pulmonary embolus had occurred, continued to have emboli as

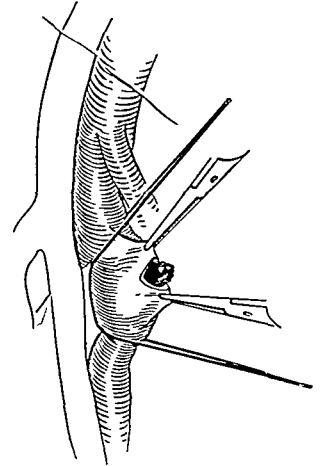


Fig. 6.—The vein is opened; fresh thrombus present.

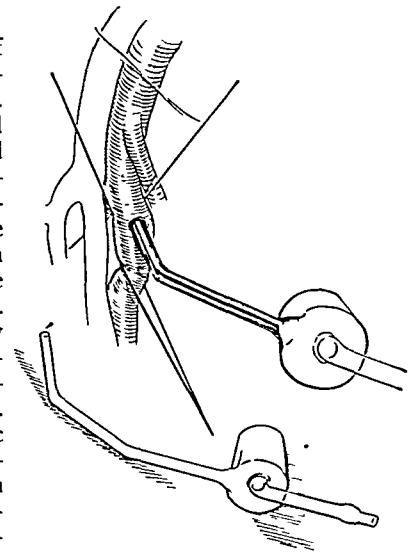


Fig. 7.—Other thrombi are removed by the Trendelenburg suction apparatus

¹⁶ Leriche, Rene, and Kunlin, Jean. Immediate Treatment of Post operative Phlebitis. *Presse méd* 42:1481, 1934
¹⁷ Ochsner, Alton, and deBakey, Michael. Thrombophlebitis. The Role of Vasospasm in the Production of Clinical Manifestations. *J A M A* 114:117 (Jan. 13) 1940

¹⁸ Murray, G O W. Heparin in Thrombosis and Embolism. *Brit J Surg* 27:567, 1940

soon as the administration of heparin was stopped. Emboli no longer occurred after ligation of the femoral vein.

These experiences with heparin lead us to our present opinion—that it is of value in the prevention of thrombosis and in the immediate treatment of an embolus, in order that there may be no extension of pulmonary thrombosis beyond the infarct. On the other hand, it cannot be depended on to prevent further emboli, once a thrombosis has been established.

Once treatment with heparin has been started, there is no way to be sure when it should be stopped. Usually we have arbitrarily continued it for ten days.

LIGATION OF THE DEEP VEIN

A fourth method of treatment involves the ligation of the femoral or iliac vein. This method of treatment was advocated by several German authors, including Kulenkampf¹⁹ and Fründ,²⁰ who reported excellent results as far as the prevention of emboli was concerned. The method has also been advocated in this country by Homans,²¹ Bancroft,²² Taylor,²³ Sears²⁴ and others.

The operative procedure itself consists essentially in the actual opening of the femoral vein, the sucking out of any intravascular clot present and the ligation of the vein. Any or all of these details may be combined in the operation. The procedure is not simple and must be done with considerable care. If it were not for a few other considerations, this method would be the answer to the problem of emboli. These considerations are:

1. Will ligation of the femoral vein prevent pulmonary emboli?
2. Is it possible to tell which femoral vein should be ligated?
3. Are there any dangerous sequelae to ligation of the femoral vein?

The importance of the large veins of the calf as a source of emboli has already been stressed. It is our belief that increasing experience will show that the veins of the lower extremity are the source of a high percentage of emboli. The remaining emboli arise chiefly from the pelvis; branches of the internal iliac vein are involved. To place the ligature on the common iliac rather than on the femoral vein would reduce the number of emboli still further. Unquestionably, a few other emboli would occur, but they should be uncommon.

After a vein has been ligated, it has been shown that the thrombosis usually extends proximally until the next venous radicle is encountered. Thus, ligation of the common femoral vein will probably result in thrombosis extending to the bifurcation of the iliac veins. It is conceivable that this new thrombus could be the source of further emboli. Practically, we have never seen this happen and, on theoretical grounds, we doubt its occurrence. The theory is this: Thrombi are more apt to be dislodged if they are floating, one end free in the blood stream; if the flow of blood is completely stopped, protection from an embolus will be assured.

It seems best to divide the femoral vein rather than to ligate it in continuity. In several instances venograms taken a year after ligation of the femoral vein in continuity have shown no evidence of recanalization, and there is, then, no advantage in ligation without division.

It also seems important to stress the fact that the vein should be opened before it is ligated or clamped. Floating thrombi are difficult to detect by palpation through the wall of the vein, so that a tie or clamp might break off a freely floating thrombus.

Granted that the decision has been made to ligate the vein, the vein to be ligated must be chosen. Does an embolus necessarily arise from the leg that shows clinical phlebitis or is it more likely to arise from the leg that is not swollen? This is a difficult question to answer. In the few patients with concomitant emboli and unilateral phlebitis who have died of embolus and have come to autopsy, the evidence has pointed to the phlebotic process as the source of emboli. We have always first ligated the femoral vein of the leg that exhibits evidence of phlebitis. The presence or absence of a thrombosis on the other side may then be confirmed by a venogram. In two cases we have had to ligate both femoral veins.

The site of ligation of the vein is of importance. If possible, it is best to ligate above the thrombosis; if this is impossible, the proximal thrombus should be removed with the Trendelenburg suction device. We believe that the optimal site of exposure and ligation is the superficial femoral region. In this case there will be practically no postoperative edema. Ligation of the common femoral vein produces more edema. Homans advocates ligation of the iliac vein, believing postoperative edema to be rare. This involves a formidable dissection for a patient ill after an operation, so that we have not used it.

There certainly are dangers involved in the ligation of femoral veins. It is for this reason that the process cannot be carried out promiscuously. On the other hand, the great fear of a swollen leg is often over-emphasized. From our experience, it appears that increased edema does not occur after ligation, or is very slight, as long as the patient is kept in bed. After mobilization edema will appear in approximately half the patients and must be controlled by compression bandages. In from three to six months the edema will practically disappear in nearly all cases. We have seen increasing pigmentation, superficial varices and a post-phlebotic ulcer appear two years after division of a femoral vein. This is the only ulcer that has occurred in our series, though no patients have yet been followed more than two years. It seems likely that the incidence of postphlebotic ulcer would be as high in patients who had had no treatment for deep phlebitis, although no definite comparison is justifiable until this group of patients has been observed several years.

Ligation of the femoral vein should also shorten the period of disability from deep phlebitis, just as ligation of the saphenous vein has made it possible for patients with superficial phlebitis to become ambulatory more rapidly. This is perhaps a qualifiable indication for the procedure.

OTHER METHODS

Other methods of treatment have been proposed. The use of leeches, plaster of paris or compression bandages, roentgen rays and injection of typhoid bacilli all have had their advocates. We have not used any of them extensively. Papaverine has often been

19. Kulenkampf, D.: The Prevention of Severe and Fatal Emboli by Means of Emptying the Iliac Vein, *Arch. f. klin. Chir.* **193**: 727, 1939.
20. Fründ, H.: Thrombectomy as a Prophylaxis Against Pulmonary Emboli, *Zentralbl. f. Chir.* **64**: 1202, 1937.

21. Homans, John: Venous Thrombosis in the Lower Limbs: Its Relation to Pulmonary Embolism, *Am. J. Surg.* **38**: 316, 1937.

22. Bancroft, F. W.; Stanley-Brown, Margaret, and Chargaff, Erwin: Postoperative Thrombosis and Embolism, *Ann. Surg.* **106**: 868, 1937.

23. Taylor, K. P. A.: Pulmonary Emboli Following Injection of Varicose Veins, *Am. J. Surg.* **45**: 145, 1939.

24. Sears, J. B.: Experience with Femoral Vein Ligation for Prophylaxis of Postoperative Pulmonary Embolism, *New England J. Med.* **224**: 108, 1941.

employed in the treatment of emboli and appears to be of definite value. It seems to us to be a definite adjuvant type of therapy but not one that should be considered as a sole therapeutic measure.

CLINICAL APPLICATION

With these various methods in mind, it is now necessary to consider their clinical application in an attempt to determine the type of treatment indicated in the individual case. In this matter, we are concerned chiefly with the incidence of emboli and the prevention of death from this cause rather than with the less important criterion of the duration of the disease.

Given a patient with deep phlebitis, how apt is he to have an embolus? Generally speaking, the chances in this series are almost 1 in 3. The incidence is variable, however, depending on age. Of 53 patients under 50 years of age with deep phlebitis, 15 had an infarct (28 per cent). Of 56 patients in the age group 50 to 70, 16 had infarcts (31 per cent). Of 10 patients 70 years of age or over, 4 had infarcts (40 per cent). There appears to be a slight increase in the number of infarcts with advancing age.

The fatal emboli are more striking. There were no deaths under the age of 50 (with concomitant clinical deep phlebitis and emboli), but 3 deaths in the group from 50 to 70 years, and 2 in the oldest group. Since the period embodied in this study we have had 1 death of a patient aged 39 from an embolus originating from phlebitis. The death rate from deep phlebitis must be regarded as extremely low under the age of 50, about 7 per cent from 50 to 70 years and 20 per cent over that age.

A consideration of the type of operation preceding the phlebitis, or of the type of initiating trauma, has not been of comparable value as far as the prognostication of fatal emboli has been concerned. The fact that operations on the genitourinary tract are frequently followed by phlebitis and pulmonary emboli seems ascribable to the age of the patient rather than to the type of operation.

Phlebitis itself, then, constitutes a warning sign. A single infarct may then occur. The mortality of this infarct was 10 per cent in this series (2 deaths among 20 patients). Of the 18 patients surviving the first infarct, 11 had no more infarcts and 7 did have others; and 2 deaths resulted from the second infarct. This indicates that there will be as many deaths after the second infarct as after the first. Among 4 patients who have had 3 or more infarcts there have been no deaths, but all of them, with 1 exception, have had ligation of the femoral vein.

On the basis of this control series, the results following ligation of the femoral vein may be summarized briefly:

Ligations of the femoral vein in our clinic have been performed in 33 instances. The indications were pulmonary infarction associated with thrombophlebitis in 18 patients and thrombophlebitis in 15 patients over 40 years of age. There was a total of 36 infarctions observed before ligation; after the procedure there was 1 case in which a pleuritic pain lasting twenty-four hours suggested an infarct, although no shadow suggestive of an infarct could be discovered by roentgen examination.

From our previous experience we should have expected 5 infarcts and 1 death in the group of patients in whom ligation had been done for phlebitis if con-

servative therapy had been followed and at least 2 deaths in the group in whom ligation had been done for pulmonary infarction if operation had not been done.

We have thus become convinced of the wisdom of ligation of the deep venous channels, not only after pulmonary infarction associated with phlebitis but also as a method of prophylaxis against emboli. We also believe that it is essential, if the vein is to be ligated to do it as soon as the diagnosis of thrombophlebitis has been made; otherwise the entire femoral vein may become rapidly involved, as Bauer has shown. Moreover, the danger of pulmonary infarction is greatest soon after the onset of phlebitis, as shown by the careful analytical studies of Barker and his associates.²⁵ Every attempt should be made to interrupt the pathologic process before it involves the upper reaches of the femoral vein.

THERAPEUTIC GUIDE

From this mass of data we must next attempt to deduce suggestions for therapy:

1. *Superficial Phlebitis.*—Great care should be taken to exclude the presence of deep phlebitis. This means that a venogram should be made before operation. If the superficial veins only are involved and the patient is not in poor condition, ligation and division of the involved saphenous vein at its junction with the femoral or popliteal vein should be performed. Heat, elevation, compression bandages, incision and drainage of fluctuant areas and excision of thrombosed venous segments are adjuvant measures.

2. *Deep Phlebitis Not Associated with an Infarct.*—Elevation, heat and sedatives should be used in all cases. Lumbar block with procaine hydrochloride is certainly of value if vasospasm is considerable or pain is severe, and perhaps in all cases. In the group under the age of 40 no other treatment need be considered unless infarcts occur, for the chances of an initial infarct being a fatal one are extremely remote. On the other hand, from the ages of 50 to 70, early ligation of the femoral vein is indicated in view of the expected mortality of 7 per cent. Over the age of 70, there is an absolute indication for venous ligation because the expected mortality from embolus is 20 per cent.

3. *Deep Phlebitis Followed by an Infarct.*—The femoral vein should be opened, thrombi removed and the vein ligated. This is necessary to prevent the 10 per cent mortality of the second infarct.

4. *Pulmonary Infarct Without Evidence of Phlebitis.*—Venograms should be done on both sides. If a thrombosis can be detected, ligation of the corresponding femoral vein is indicated. A small infarct with minimal pulmonary symptoms may be treated conservatively. If the infarct is severe, heparin therapy should be instituted.

CONCLUSION

It is only fair to state that the operation of ligation of the femoral vein has appealed to us more strongly as we have become more familiar with the procedure. At present, we believe that the immediate decision to be made in any given case of thrombophlebitis is whether the patient should be treated conservatively or by ligation of the vein. If conservative therapy is employed, lumbar injection of procaine hydrochloride should be done if vasospasm is considerable. If the deep venous channels are interrupted, heparin is often of value

25. Barker, N. W.; Nygaard, K. K.; Walters, Waltman, and Priestley, J. T.: A Statistical Study of Postoperative Venous Thrombosis and Pulmonary Embolism, Proc. Staff Meet., Mayo Clin. 15:769 (Dec. 4) 1940.

administered postoperatively. It must be emphasized that these concepts may be modified greatly as our experience increases. The important fact is that thrombophlebitis is no longer observed passively but is now accepted as a disease that must be vigorously treated.

ABSTRACT OF DISCUSSION

DR. ALTON OCHSNER, New Orleans: The authors have emphasized that it is of importance to distinguish between phlebothrombosis and thrombophlebitis. In phlebothrombosis the patient does not appear very ill, but the condition is potentially dangerous because of the likelihood of embolism. The patient with thrombophlebitis is an individual who appears ill, whose extremity is quite swollen and who has a great deal of pain. The best treatment of thrombophlebitis is the overcoming of the vasospasm by procaine block of the regional sympathetic ganglions. My associates and I have treated 71 patients who had thrombophlebitis. The most dramatic result was the relief of pain. Ninety per cent were permanently relieved of pain by the first procaine sympathetic block. The subsidence of fever was also dramatic. Approximately 65 per cent were fever free in forty-eight hours or less, 24 per cent in from three to five days, 7 per cent in from six to eight days, and 4 per cent had fever more than eight days. The relief of edema was also dramatic. Fifty-six per cent had normal extremities in four days or less, 32 per cent in from five to eight days, 8 per cent in from nine to ten days, and only 2 patients had edema as long as twelve days. All of these were patients with typical phlegmasia alba dolens who otherwise would have had fever and edema for a period of six to eight weeks and a possible persistent edema for the rest of their lives. Occasionally more radical measures, such as ligation, are necessary in thrombophlebitis. When suppuration occurs, tying of the vein proximal to the thrombophlebitic segment is required to prevent the dissemination of infected emboli. In phlebothrombosis the clotting is likely to occur in certain veins in which stasis is greatest. As the authors have emphasized, the presence of Homans' "dorsiflexion sign" suggests phlebothrombosis of the calf veins, because often phlebothrombosis originates in the plantar veins of the foot; demonstration of tenderness on the plantar aspect of the foot is of importance. It is a rule in our service that every patient who isn't doing well, who has an elevation of pulse out of proportion to the temperature or who has a sense of impending disaster, a point which I would emphasize, not only shall be given Homans' test but have all the plantar veins investigated. It is of importance postoperatively to prevent this condition, to prevent the stagnation of the veins of the lower extremity by not having these patients lie perfectly flat. Either the foot of the bed should be elevated or, if they are lying flat, the thighs should be flexed on the trunk and the leg elevated to prevent angulation of the veins at the pelvis and at the knee.

DR. CONRAD R. LAM, Detroit: I should like to add a word about one method of treatment which the authors have mentioned; namely, heparinization. I shall be particularly concerned with the management of the embolic manifestations of phlebitis. Since April 1939 Dr. McClure and I have treated 34 such patients, all of whom had good evidence of embolism, such as hemoptysis, pain in the chest, physical findings and x-ray signs. Thirty-two of these patients survived. One apparently died of the original large infarct, while the other had a second and fatal embolism after one week of heparin therapy. Last year we reported that the cost of heparin treatment was about the same as special nurses; namely, about \$15 a day. Now, with additional commercial preparations on the market, the cost has come down considerably and it can be stated that the price of a day's supply of heparin may be only \$6 or \$7, or about the cost of a hospital room. It is probable that this material is of value in selected cases.

DR. HENRY H. FAXON, Boston: From what has been said, some of you might get the impression that only in patients with a clinical deep phlebitis need we fear the accident of massive embolism. I should like to correct any such idea. Dr. Welch and I found in reviewing the 128 cases of fatal pulmonary embolism that have occurred at our hospital during the last thirteen years that in only 5.5 per cent did the surgeon in charge

realize that the condition was a deep phlebitis. In other words, almost 95 per cent of these patients had such bland phlebothromboses that it was not appreciated that they were potential candidates for fatal emboli. It is true that all of these patients must have had deep peripheral thromboses present, for otherwise they could not have suffered fatal pulmonary emboli. If we are to lower the deaths from massive embolism and discover the cases in which various corrective measures such as ligation of the femoral vein or other corrective steps can be taken, we must first do something in the way of study that will lead us to detect those patients who have bland thromboses. Furthermore, we should adopt some method of study that will provide us with the fullest information as to the status and extent of these thromboses. I would like to add a word of enthusiasm for the use of venograms to accomplish these two aims. It would seem from what is still a somewhat limited experience that the use of this diagnostic aid has probably contributed more to an understanding of the underlying pathologic condition in this field than any other step that has been put forward for many years.

THE SURGICAL TREATMENT OF HYPERTENSION: II

COMPARISON OF MORTALITY FOLLOWING OPERATION WITH THAT OF THE WAGENER-KEITH MEDICALLY TREATED CONTROL SERIES: A STUDY OF SEVENTY-SIX CASES FROM FIVE TO SEVEN YEARS AFTER OPERATION

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AND

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In a previous paper¹ we presented the results of 350 consecutive cases of hypertension in which treatment was by bilateral supradiaphragmatic splanchnicectomy and lower dorsal sympathetic ganglionectomy.

Our purpose in the present paper is to compare the results of this operation with those of an analogous series in which treatment was by medical means alone.

The first 76 consecutive cases of our main series were chosen for this study because the postoperative period of from five to seven years seemed adequate to evaluate the results fully and because this time period lends itself to comparative study.

A careful review of the literature concerning the results of therapy and the mortality rate in hypertension reveals an unexpected degree of confusion. This confusion results chiefly from inadequate classification of the cases before and after therapy and an inadequate period of observation after the therapy.

The fundamental question in the mind of the physician confronted with a patient with hypertension is "What is the prognosis of a patient of a certain age, of a certain sex, with a certain level of hypertension and with or without certain organic changes?" No control series giving a complete answer to this question could be found. It has been necessary, therefore, to choose from the various reports a series which, from one definite and objective aspect, i. e. retinal changes, presents a classification of hypertensive patients into clearly defined groups, and which states, after an adequate period of post-therapeutic observation, the mortality of these patients. Wagener and Keith² have

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This study was aided by a grant from the Aaron Mendelson Trust Fund to the Section of Neurosurgery.

1. Peet, M. M.; Woods, W. W., and Braden, Spencer: *The Surgical Treatment of Hypertension*, J. A. M. A. 115: 1875-1885 (Nov. 30) 1940.

2. Wagener, H. P., and Keith, N. M.: *Diffuse Arteriolar Disease with Hypertension and the Associated Retinal Lesions*, Medicine 18: 317-430, 1939.

presented a five to nine year follow-up study of 219 cases of essential hypertension classified according to retinal changes. They state: "The present series of cases offers a good control for any specific form of therapy, as treatment consisted of general measures, especially with regard to diet and rest, and the regular use of certain sedatives."

In the tables are presented the comparative mortality statistics of Wagener and Keith on 219 patients treated medically and followed for from five to nine years and of our series of 76 consecutive patients operated on by one of us (M. M. P.) and followed for from five to seven years. The discrepancy between the length of the two studies (five to nine years as against five to seven years) does not obviate relatively accurate comparison for two reasons: First, the time span of the medically treated control group is calculated from the time of the first observation of the patient, whereas in our series it is calculated from the time of operation. By far the majority of our patients had been observed over a considerable period of time and had been given a trial of medical treatment before operation was even considered. Second, as is shown in the accompanying charts, the deaths occurring after seven years in the control series were so few that their inclusion in the statistics does not alter the totals significantly.

A factor which cannot be controlled in the comparison of these two series is the selection of patients. Presumably the patients of Wagener and Keith were unselected and consecutive. Our patients were, by necessity, selected in that they were in sufficiently good physical condition to permit operation. Briefly, the criteria for selection for operation were:

Age: under 60 years, preferably under 50.

Renal function: nonprotein nitrogen of the blood under 45 mg. per hundred cubic centimeters, urine concentration above 1.012 and urea clearance above 40 per cent of normal.

Cardiac status: a compensated heart.

All patients had "essential" or "malignant" hypertension, i. e. a primary type of high blood pressure for which no organic cause could be found. Among the early patients with hypertension several exceptions to these criteria were made, since at that time our concept of an operable patient was still in a formative period. A very high blood pressure has never been a contra-indication to operation, as will be shown in the second portion of this paper. Unfortunately, the Wagener-Keith control series of medically treated patients is not presented completely in regard to the cardiac status, renal status and blood pressure levels of the patients. A reservation regarding selection must then be held in mind in a comparison of the results tabulated.

MORTALITY STATISTICS

The classification of hypertensive patients according to observable retinal changes is an excellent one. It offers a means whereby the diffuse arteriolar disease of hypertension can be directly and easily observed and thus the degree of severity of the process can be evaluated.

It still remains to be seen whether or not the present interpretation and classification of fundus changes offer a true means of prognosis in hypertension.

Keith³ originally divided patients with hypertensive disease into four groups. We have followed this grouping because of its common usage rather than its com-

plete acceptability as a means of differential diagnosis and prognosis. Briefly, group 1 consists of those patients with diffuse arteriolar disease and mild hypertension who have no definite symptoms, no cardiac or renal failure and whose retinal arterioles exhibit a mild grade of narrowing and chronic sclerosis. Group 2 consists of those patients with a relatively higher blood pressure, with symptoms such as headache and increased nervousness, whose retinal arterioles show a more significant grade of narrowing and sclerosis but without angiospasm. Group 3 consists of those patients with a relatively high blood pressure, with definite symptoms and whose retinal arterioles show unmistakable angiospastic narrowing. In this group are included also those with angiospastic retinitis without measurable papilledema. Group 4 includes those with measurable papilledema and the concomitant diffuse angiospastic retinitis with varying degrees of chronic sclerosis of the arterioles.

TABLE 1.—Number and Sex of Patients

Keith Hyper- tension Group	Male		Female		Total	
	Wagener- Keith	Peet	Wagener- Keith	Peet	Wagener- Keith	Peet
1	7	0	3	4	10 (4%)	4 (5%)
2	14	6	12	9	26 (12%)	15 (20%)
3	22	11	15	22	37 (17%)	33 (43%)
4	99	11	47	13	146 (67%)	24 (32%)
Totals	142	28	77	48	219	76

TABLE 2.—Age *

Keith Hyper- tension Group	Range in Years		Mean Years	
	Wagener- Keith	Peet	Wagener- Keith	Peet
1	30-65	38-48	55	43
2	21-59	18-57	41	39
3	22-57	23-55	42	42
4	8-64	21-57	40	41

* Wagener-Keith: age at time of first examination; Peet: age time of operation.

It is suggested that, in order to simplify and make purely objective the classification of essential hypertension according to ocular changes in the fundus the following four groups be adopted (substituting a group with normal fundi, consolidating those with purely arteriolar sclerotic changes into another group and basing the last two groups on the presence of angiospasm or papilledema): group 1, normal fundus; group 2, arteriolar sclerosis without angiospasm; group 3, unmistakable angiospasm with or without arteriolar sclerosis, hemorrhages or exudates, and group 4, papilledema. It will be shown later that the prognostic value of this classification from the surgical point of view is greater than that of the original classification of Keith and has the added advantage of being purely objective rather than of including such variables as level of blood pressure and subjective symptoms. For the purpose of comparison, however, the fundus groupings referred to in the body of this paper will be those of Keith's original classification.

In a comparison of the relative numerical distribution of the two series according to the Keith hypertension grouping (table 1), it may be seen that the percentages in groups 1 and 2 are approximately equal. Wagener and Keith have a larger percentage in group 4,

3. Keith, N. M.: Cardiovascular Diseases in Relation to the Retina. Tr. Am. Acad. Ophth. 37: 37-49, 1932.

whereas in our series the larger percentage is in group 3. It should be noted, however, that both series have the greatest number of cases in the two groups showing the most "serious" retinal changes (Wagener-Keith 84 per cent and Peet 75 per cent in groups 3 and 4).

TABLE 3.—Living Patients

A. Patients Alive *				
Keith Hypertension Group	Total Patients Studied		Total Patients Alive	
	Wagener-Keith	Peet	Wagener-Keith	Peet
1	10	4	6 (60%)	4 (100%)
2	26	15	9 (34%)	6 (40%)
3	37	33	3 (8%)	21 (64%)
4	146	24	1 (1%)	8 (33%)
Totals	219	76	19 (9%)	39 (51%)

B. Sex of Living Patients				
Keith Hypertension Group	Male		Female	
	Wagener-Keith	Peet	Wagener-Keith	Peet
1	4 (37%)	0 (0%)	2 (66%)	4 (100%)
2	4 (28%)	1 (17%)	5 (42%)	5 (55%)
3	2 (9%)	7 (64%)	1 (6%)	14 (64%)
4	0 (0%)	3 (27%)	1 (2%)	5 (38%)
Totals	10 (7%)	11 (39%)	9 (12%)	28 (58%)

* Keith-Wagener: alive five to nine years after first examination; Peet: alive five to seven years after time of operation.

Sex distribution (table 1) reveals 65 per cent males in the Wagener-Keith series as against 36 per cent in our series. Since it is well known that males tolerate hypertension less well than females, this disproportion of males and females in the two series would seem

TABLE 4.—Deaths

A. Patients Dead *				
Keith Hypertension Group	Total Patients Studied		Total Patients Dead	
	Wagener-Keith	Peet	Wagener-Keith	Peet
1	10	4	4 (40%)	0 (0%)
2	26	15	17 (65%)	9 (60%)
3	37	33	34 (92%)	12 (36%)
4	146	24	145 (99%)	16 (67%)
Totals	219	76	200 (91%)	37 (49%)

B. Sex of Patients Dead				
Keith Hypertension Group	Male		Female	
	Wagener-Keith	Peet	Wagener-Keith	Peet
1	3 (33%)	0 (0%)	1 (33%)	0 (0%)
2	10 (71%)	5 (83%)	7 (58%)	4 (44%)
3	20 (91%)	4 (36%)	14 (93%)	8 (36%)
4	99 (100%)	8 (73%)	46 (95%)	8 (62%)
Totals	132 (93%)	17 (61%)	68 (88%)	20 (42%)

* Wagener-Keith: died five to nine years after first examination; Peet: died five to seven years after time of operation.

to be of considerable importance in the ultimate mortality. Careful analysis, however, of table 4 B demonstrates a relatively small difference in mortality between the two sexes in the control group (93 per cent males as against 88 per cent females).

There is a remarkably close correspondence of the mean ages per group in the two series (table 2). It is interesting to note that in group 1 the age is more

advanced than in the other three groups, the mean ages being practically identical both in the control and in the surgical series.

Tables 3, 4 and 5 demonstrate the definitely lower mortality among hypertensive patients treated surgically. Thus, analysis of the mortality rates after five years (table 5) shows that the total mortality for the control group is 87 per cent as against 47 per cent for the surgically treated group. These percentages, however, are not strictly comparable because of two factors: surgical selection and the larger percentage in group 4 in the medically treated group. Therefore, analyzing the mortality rates more exactly by hypertension groups, one finds that in group 4 99 per cent of the control series were dead, contrasted with 66.5 per cent in the surgically treated series. In group 3 80 per cent of those treated medically died within five years, whereas only 36 per cent of the surgically treated patients died. In group 1 the mortality for the medical control series was 30 per cent, contrasted with no deaths in the surgical group—which, however, included only 4 cases. It is in group 2 (those patients with high blood pressure and retinal arteriolar sclerosis) that the mortality of the surgical treated patients (60 per cent) exceeds that of the medically treated group (46 per cent). This difference becomes

TABLE 5.—Deaths Within a Given Number of Years

Years	Group 1		Group 2		Group 3		Group 4	
	Wagener-Keith	Peet	Wagener-Keith	Peet	Wagener-Keith	Peet	Wagener-Keith	Peet
1	10%	0	12%	33% (1 operative)	35%	0%	79%	37.5% (2 operative)
2	20%	0	23%	46%	67%	12%	88%	50%
3	30%	0	38%	46%	78%	21%	94%	61.5%
4	30%	0	42%	53%	78%	24%	98%	66.5%
5	30%	0	46%	60%	80%	33%	99%	66.5%

less striking, however, on examination of the survival curves (chart 2) in which it may be seen that the mortality for those in group 2 treated medically, if followed for only six months longer (total sixty-six months), becomes approximately 57 per cent, and that for the surgical series the mortality at this time remains unchanged at 60 per cent. Thus, the mortality rate for group 2 may be said to be almost identical in the two series.

Comparison of mortality rates of the two sexes (table 4 B) reveals a higher death incidence among males (93 per cent in the Wagener-Keith control series; 61 per cent in the surgical series) than among females (Wagener-Keith 88 per cent; Peet 42 per cent). It is interesting to note, however, that in groups 3 and 4 there is relatively little difference in the mortality rates according to sex, although here again are clearly seen the significantly lower rates in the surgically treated series.

In charts 1, 2, 3 and 4 we have reproduced separately the survival curves of the four hypertension groups as given by Wagener and Keith. In the same manner we have calculated the survival curves of our patients and present them for comparison with those of the medical control group. The striking differences in these curves becomes at once apparent.

In chart 1 the survival curve for group 1 shows a wide time distribution of the 10 deaths in the control

series, and the straight line is indicative of no deaths in the surgically treated patients (only 4). From such a small number of patients probably no absolutely accurate assumption can be made, but it would appear that operation may well have altered the course in these patients. Without it, according to the control series, one third of them would have been dead within five years.

Comparing the survival curves of group 2, however, one finds that an entirely different situation exists. To these patients with high blood pressures and well defined arteriolar sclerosis without angiospasm of the retinal vessels, operation seems to have offered little or nothing in the way of increasing the survival time. At seventy-two months the two curves meet at 40 per cent. Before this the surgical group has had a definitely lower survival curve. One explanation may be that, of the 9 patients who died in the surgical series, 4 (44.4 per cent) died within the first six months. It is to be considered that the operation might have resulted in a disproportionate percentage of early deaths. Certainly the operation, symptomatic relief being disregarded, seems to have been of little significance in altering the course of the disease.

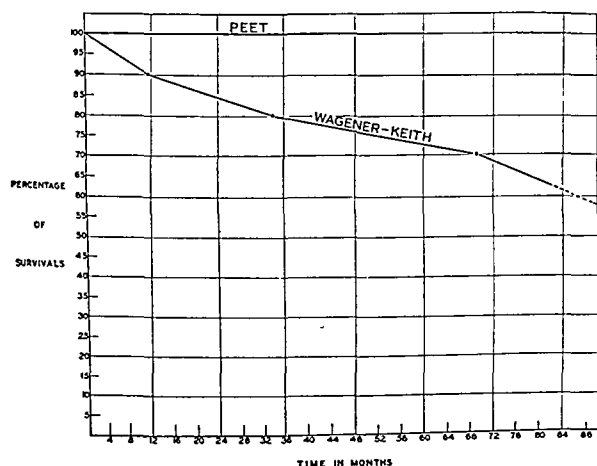


Chart 1.—Comparison of survival curves of group 1.

It is in the study of the survival curves of group 3 that the effects of operation in lessening the mortality of essential hypertension become unmistakably apparent. It should be remembered that in this group the level of the blood pressure is high (average 225 systolic and 134 diastolic); symptoms are present, often very severe; examination of the retinal arterioles reveals unequivocal angiospastic narrowing and, frequently, advanced retinitis with hemorrhages and exudates; renal function may be diminished, and cardiac damage exists in varying degree. It is remarkable, therefore, that the survival percentages of this group, following surgery, are only slightly less than those of group 1 in the control series; they are definitely higher than those of group 2 in both the control and the surgical series and are significantly higher than the comparable group 3 in the control series (57 per cent surgical survivals after five years as against 20 per cent of those patients treated medically).

The evident prolongation of life by operation in this group immediately brings up the question of the comparability of the patients included in the two series. Analysis of the 33 patients in our group 3 shows that 11 patients had fundi which revealed both hemorrhages and exudates, 5 had exudates alone, 7 had hemorrhages alone, 2 had severe angiospasm and evidence of old

hemorrhages and exudates, 1 had severe angiospasm and very early papilledema (not considered advanced enough to be placed definitely in group 4), 1 had severe angiospasm and retinal edema and 6 had no other retinal abnormality present at the time of examination than unmistakable and severe angiospasm. In the last

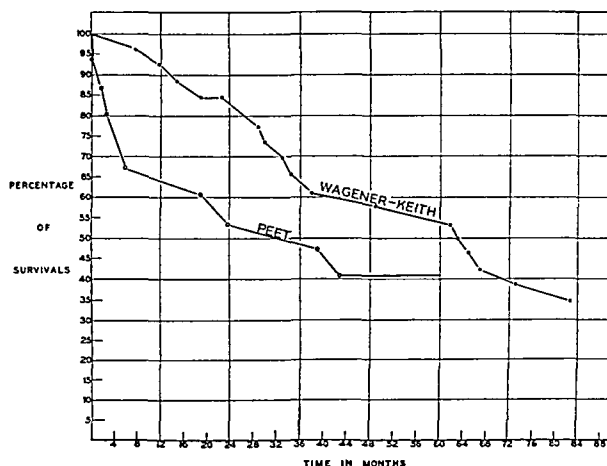


Chart 2.—Comparison of survival curves of group 2.

6 patients mentioned the blood pressure, without exception, was very high (average 220 systolic and 133 diastolic). All complained of severe headaches and other symptoms typical of well defined hypertension. Varying degrees of renal and cardiac damage were present. We have felt that these patients should definitely be included in group 3, since by definition they cannot be included in group 1 or 2 (organic changes of retinal arteriolar sclerosis), or in group 4 (papilledema). Keith and Wagener⁴ state that the 6 patients should probably be included in group 3 and that their classification does not define exactly the category into which patients with only unmistakable angiospasm of the retinal arterioles should be placed. We suggest

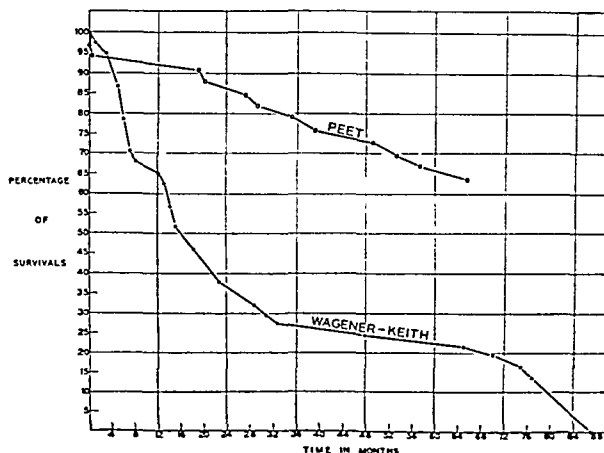


Chart 3.—Comparison of survival curves of group 3.

once again, therefore, that the retinal lesions of hypertension should be classified in four objective groups (group 1, normal fundi; group 2, arteriolar sclerosis without angiospasm; group 3, unmistakable angiospasm with or without varying degrees of arteriolar sclerosis, with or without hemorrhages and exudates; group 4, papilledema).

4. Personal communication to the authors.

With the establishment of the comparability of the two series it may be said that operation has definitely diminished the mortality in this group of patients.

The malignant type of hypertension (group 4) is rapidly fatal. Wagener and Keith state: "The mortality in cases of group IV approaches that found in certain forms of cancer." In their control series 88 per cent of the patients with malignant hypertension were dead within eighteen months. All but 1 patient were dead at the end of five years. In our series of surgically treated patients who had malignant hypertension one half were alive after two years and one third alive after five years. Examination of the survival curves for group 4 reveals that not only are the survival percentages decidedly higher in the surgically treated group as compared with the same group in the control series but also survival is actually higher than in group 3 under medical treatment. It cannot be denied that the surgical treatment of malignant hypertension has definitely decreased the fatality of the disease in our series. The fact that only those patients suitable for operation were included in our series could be presented as an argument against the comparability of the two series.

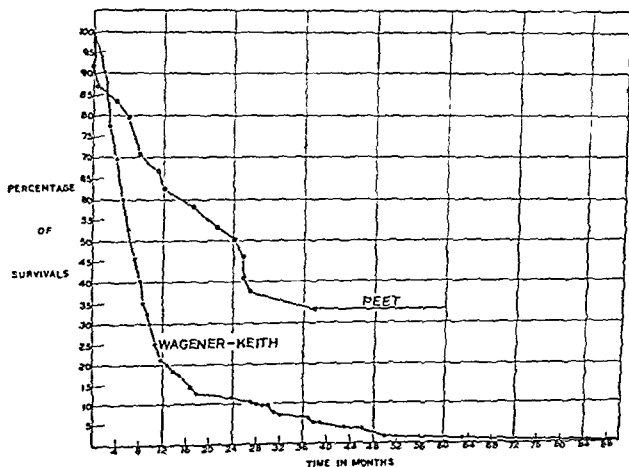


Chart 4.—Comparison of survival curves of group 4.

This objection becomes untenable when the fact is brought out that 98 per cent of the control series (146 patients) were dead at the end of five years. It is implausible to believe that all these patients would have been unacceptable for surgery had they presented themselves for operation.

Confirmation of the fatality of malignant hypertension can be found in the series followed by Page⁵ for seven years. Of the 18 patients treated by means other than surgery, 89 per cent were dead at the end of the observation period.

Palmer⁶ states: "The severe cases at the younger age [under 45] most frequently are malignant. Medical treatment can offer nothing to stay the rapid progress and can give only brief and partial symptomatic relief. Any possible help from surgery either in halting progress or in real symptomatic relief will be most welcome." The same author writes: "Any real amelioration [of severe hypertension over 45 years of age] by surgical intervention is inconceivable." We offer our statistics in answer to the first statement and in contradiction to the second.

5. Page, I. H.: A Clinical Study of Malignant Hypertension, *Ann. Int. Med.* 12: 978-1004, 1939.

6. Palmer, R. S.: The Efficacy of Medical Treatment in Essential Hypertension, *New England J. Med.* 215: 569-572, 1936.

BLOOD PRESSURE STATISTICS

Results of treatment in hypertension are most commonly reported in terms of pretherapeutic and post-therapeutic blood pressure values. This type of evaluation, reached without controlled methods and uncorrelated with mortality, renal function, cardiac status, fundus changes and symptomatic relief, is open to criticism because of the considerable variations of blood pressure levels from reading to reading. Ayman⁷ states: "Successful therapeutic reduction of blood pressure in essential hypertension may be simulated by many disregarded factors operating on the lability of blood pressure and the hypertensive personality. The failure to control adequately these factors has led to many apparent successes in the past." Ayman considers persistent reduction of at least 30 mm. of mercury systolic as a criterion of drop in blood pressure due to therapy.

We have been fully aware of the difficulty in evaluating therapeutic drops in blood pressure and have attempted to control as carefully as possible our methods of determination. We feel, as already stated, that an objectively measurable factor, such as retinal changes, is the best method of classifying cases of hypertension before operation. Since, however, most authors have presented blood pressure determinations as the method of pretherapeutic and post-therapeutic classification, we shall include the blood pressure levels of our series before and after operation and correlate these levels with the preoperative funduscopic grouping. In our previous paper we have given in detail our methods and criteria of the measurable aspects of hypertension. Briefly, those pertaining to blood pressure include:

The preoperative blood pressure value, which is the arithmetical average of all readings taken in the hospital by all observers before operation. Usually the patients were on bed rest and had previously had a thorough trial of medical treatment.

The postoperative blood pressure value, which is the arithmetical average of four determinations from each arm taken with the patient in a sitting position at the time of his entry into the office. Any readings taken independently by other observers were also included. These patients were almost invariably ambulatory and were in the midst of rigorous check-up examinations by the various departments of the University Hospital Clinic.

In general, it could be said that the preoperative blood pressures were determined under conditions optimum for a low level and the postoperative pressures under conditions conducive to a high level. This would seem to make the criteria given here definitely valid.

A drop of 40 mm. of mercury systolic and 15 mm. diastolic or more from the preoperative level is considered a significant reduction in blood pressure. No pressure is considered significantly reduced unless both systolic and diastolic values are lowered the stated amount.

A drop of 80 mm. systolic and 25 mm. diastolic or more is considered a decided reduction in blood pressure. Both systolic and diastolic values must be lowered the stated amount.

A drop to, or lower than, 130 mm. systolic and 90 mm. diastolic for patients up to the age of 40 is considered a reduction of blood pressure to "normal." After the age of 40 the drop must be to, or lower than,

7. Ayman, David: The Evaluation of Therapeutic Results in Essential Hypertension, *J. A. M. A.* 96: 2091-2094 (June 20) 1931.

150 mm. systolic and 100 mm. diastolic. Both systolic and diastolic values must be lowered the stated amount.

A rise of 10 mm. systolic and 5 mm. diastolic is considered an increase in blood pressure. Both systolic and diastolic values must be raised the stated amount.

In order to eliminate a mere temporary drop in blood pressure following a major operative procedure, no

TABLE 6—Preoperative Blood Pressure Averages (Correlated with Keith Hypertension Grouping)

Preoperative Keith Hypertension Grouping	Preoperative Blood Pressure Averages
1	191/115
2	217/131
3	225/134
4	227/148

postoperative result was considered unless at least nine months or more had elapsed since the time of operation.

Table 6 demonstrates that the preoperative blood pressure level in each group was higher than that in the preceding group and that the levels, especially in groups 3 and 4, were very high.

In table 7 are presented the postoperative results in 60 cases studied at least once nine months or more postoperatively. It is of great significance to note that those cases presenting the highest blood pressures and the retinal changes of papilledema or angiospastic retinitis (groups 4 and 3) are those in which the greatest benefit from surgery was derived. In fact, both groups show a percentage of cases presenting reduced pressures twice that of group 2. It should not be overlooked that only 6 per cent of the cases showed an increase in blood pressure following operation.

In our previous paper, presenting statistics on 350 patients, the percentage with reduced blood pressure nine months or more postoperatively was 51.4, as against 42 for this smaller series. We suggest that this difference may be due to the fact that many of our earlier patients were operated on who would not now be considered candidates for surgery. We have also shown in the statistics of our larger series that the reduction of blood pressure is maintained throughout

TABLE 7—Postoperative Blood Pressures (Correlated with Preoperative Keith Hypertension Group)

Preoperative Keith Hypertension Group	Total Cases Studied Postoperatively (9 Mos or Later)	Reduced	Unchanged	Increased
1	4	1 (25%)	3 (75%)	0
2	9	2 (22%)	7 (78%)	0
3	31	15 (48%)	14 (45%)	2 (7%)
4	16	7 (44%)	7 (44%)	2 (12%)
Totals	60	25 (42%)	31 (52%)	4 (6%)

the postoperative years. Many patients in the present series did not present themselves for their first check-up study for several years after operation. No selection of patients has been made since; of the 16 patients not considered in table 7, 15 were dead within nine months and only 1 failed to return for check-up.

Table 8 is included in order to demonstrate that the postoperative reduction in blood pressures is not minimal. It should be noted that 43 per cent of the patients with reduced pressure either had pressures reduced to normal or markedly reduced. In our larger series the

percentage is 48, the difference again probably being due to our early acceptance of patients who, in later years, were not considered fit candidates for surgery.

In addition to the definite results obtained by surgery in reducing blood pressure, it is of significance to note the effect on the ocular fundi. Of 12 patients in group 4 preoperatively (papilledema with malignant hypertension) and followed nine months or more postoperatively, all showed improvement in the retinal changes; 9 of the 12 had complete disappearance of the papilledema. Of 26 patients in group 3, 69 per cent showed postoperative improvement in the retinal lesions, 27 per cent were unchanged and 4 per cent were worse. Of 8 patients in group 2, 4 were improved and 4 were unchanged. The 4 patients in group 1 remained unchanged following operation.

Operative treatment in this series, as in our larger series, resulted in improvement in symptoms and incapacitation. Thus, of the 15 patients in group 4 on whom data were obtained nine months or more postoperatively, 6 became completely free of symptoms and 8 were partially improved. Eight patients who were partially or completely incapacitated before operation returned

TABLE 8—Analysis of Patients with Reduced Blood Pressure (Correlated with Preoperative Keith Hypertension Grouping)

Preoperative Keith Hypertension Group	Total Patients with Reduced Pressure (9 Mos or More Post-operative)	Reduced to Normal (130/90 for Ages 20 to 40; 150/100 for Ages 40 to 60)	Markedly Reduced (More than 80 Mm Systolic and 25 Mm Diastolic)	Reduced (But Not to Normal or Markedly)
1	1	1	0	0
2	2	0	0	2
3	15	4	1	10
4	7	2	3	2
Totals	25	7 (27%)	4 (16%)	14 (56%)

to full time work postoperatively. Two showed partial improvement in their incapacitation. There were none whose symptoms or incapacitation grew worse.

In group 3 data on postoperative symptoms and incapacitation were obtained on 31 patients. Thirteen became symptom free and 16 returned to full time work, having been totally or partially incapacitated before operation. Fourteen showed partial improvement in symptoms and 4 partial relief of incapacitation. No patient had more severe symptoms following operation. Only 1 became more incapacitated.

In group 2 (9 patients studied) 4 became symptom free and 4 showed partial improvement. Five returned to full time employment and 3 had partial relief of their incapacitation. None became worse.

Of the 4 patients in group 1 none developed symptoms, 2 returned to full time work, 1 was partially relieved of incapacitation and 1 became partially incapacitated.

Because of incomplete studies made in some of the early cases presented in this series no conclusive statistics on improvement in renal and cardiac function are presented. It is to be expected, however, that, in general, results would be the same as in the study of 350 cases, i. e. heart size diminished in 64 per cent, improvement in electrocardiogram in 53 per cent, improvement in urea clearance in 52 per cent and improvement in urine concentration in 45 per cent. We shall present a correlation between fundoscopic observations and renal function in a future paper.

COMMENT

Search through the voluminous literature on the treatment of hypertension has failed to yield studies which, like those of Wagener and Keith, can be compared accurately with ours. This failure is usually due to lack of precise classification of the cases, inadequacy of post-therapeutic time of observation and lack of mortality statistics.

Most observers in the field of hypertension, however, agree that persons under 50 years of age with a high level of blood pressure, severe symptoms, definite organic damage resulting in retinal changes and decreased renal and cardiac function respond poorly to treatment. Patients with malignant hypertension are regarded as hopeless.

Blackford, Bowers and Baker⁸ state: "We have no instance in which continued observation has shown any constant normal blood pressure after a reading above 175 has been made at first examination." Palmer and Thorp⁹ have stressed the severity and rapid fatality in younger patients (under 45 years) with the severe and malignant types of hypertension. Keith, Wagener and Kernohan¹⁰ in 1928 described the syndrome of malignant hypertension characteristically marked by a rapidly fatal outcome. Page,¹¹ Ellis,¹² Murphy and Grill¹³ and others have amply confirmed this.

The less severe forms of essential hypertension respond to various methods of therapy in respect to both symptomatology and reduction in blood pressure. Ayman¹⁴ analyzed thirty-five articles in all of which symptomatic relief, reduction in blood pressure or both are claimed. Psychotherapy,¹⁵ potassium sulfocyanate¹⁶ and reduction of weight with sedation all have ardent adherents. In none of the articles dealing with these methods, however, were we able to find comparable mortality statistics over an extended period of years. Few described results which were maintained over an adequate post-therapeutic period, nor was an exact definition given of what were considered "good" results.

The surgical treatment of hypertension has been reported by various workers: Crile,¹⁷ Smithwick,¹⁸ Page and Heuer,¹⁹ Peet, Woods and Braden,¹ and Allen and Adson.²⁰ As yet no extended study of mortality has been presented. All state that there is reduction in blood pressure and symptomatic relief.

8. Blackford, J. M.; Bowers, J. M., and Baker, J. W.: Follow-Up Study of Hypertension, *J. A. M. A.* **94**: 328-333 (Feb. 1) 1930.

9. Palmer, R. S., and Thorp, E. G.: Clinical Considerations in Regard to Etiology, Characteristics, and Prognosis in Essential Hypertension at Different Ages, *New England J. Med.* **214**: 1019-1022, 1936.

10. Keith, N. M.; Wagener, H. P., and Kernohan, J. W.: The Syndrome of Malignant Hypertension, *Arch. Int. Med.* **41**: 141-188 (Feb.) 1928.

11. Page, I. H.: A Clinical Study of Malignant Hypertension, *Ann. Int. Med.* **12**: 978-1004, 1939.

12. Ellis, A.: Malignant Hypertension, *Lancet* **1**: 977-980, 1938.

13. Murphy, F. D., and Grill, John: So-Called Malignant Hypertension: A Clinical and Morphologic Study, *Arch. Int. Med.* **46**: 75-104 (July) 1930.

14. Ayman, David: An Evaluation of Therapeutic Results in Essential Hypertension, *J. A. M. A.* **95**: 246-249 (July 26) 1930.

15. Robinson, S. K.: A Comparison of the Medical and Surgical Treatment in Hypertension with Special Reference to the Importance of Psychic Factors in Evaluating the Results with a Report of Ninety-Two Cases Treated Medically, *J. Nerv. & Ment. Dis.* **91**: 157-174, 1940. Ayman.¹⁴

16. Davis, Loyal, and Barker, M. H.: Clinical and Experimental Experiences in the Surgical Treatment of Hypertension, *Ann. Surg.* **110**: 1016-1036, 1939.

17. Crile, George: The Surgical Treatment of Hypertension, Philadelphia, W. B. Saunders Company, 1938.

18. Smithwick, R. H.: A Technic for Splanchnic Resection for Hypertension, *Surgery* **7**: 1-8, 1940.

19. Page, I. H., and Heuer, G. J.: Treatment of Essential and Malignant Hypertension by Section of Anterior Nerve Roots, *Arch. Int. Med.* **59**: 245-298 (Feb.) 1937.

20. Allen, E. V., and Adson, A. W.: The Treatment of Hypertension: Medical Versus Surgical, *Ann. Int. Med.* **14**: 288-307, 1940.

Ryland and Holman²¹ have reported results on 40 hypertensive patients following bilateral supradiaphragmatic splanchnicectomy and lower dorsal sympathetic ganglionectomy. These results are not comparable to those in our series, since the authors state that they have ignored the usual criteria for selection of patients. Thus, of the 34 patients who either died or failed to have a drop in blood pressure following operation, 24 (70 per cent) had elevated blood ureas ranging from 25 to 80 and would, consequently, have been considered unfit for operation in our clinic. The 6 patients whose blood pressures were reduced all had normal preoperative blood ureas. Thus these authors contribute mainly confirmation of the fact that patients with definitely elevated blood nonprotein nitrogen levels (or blood urea) should not be operated on.

Allen and Adson, in their five year study of 224 patients on whom bilateral subdiaphragmatic resection of the splanchnic nerves was performed, with resection of the celiac ganglion and resection of the lumbar sympathetic trunk, including the first and second lumbar ganglions, state: "Rapidly progressive hypertension seems to respond less favorably than slowly progressive hypertension does. Generally, patients with very high blood pressures (220 systolic and 130 diastolic or more, expressed in millimeters of mercury) respond unfavorably to sympathectomy." This has not been our experience, as shown by the statistics presented and by the fact that the average preoperative blood pressure of our 350 patients previously reported on was 218 systolic and 133 diastolic and of this series of 76 patients was 225 systolic and 137 diastolic. Of our group 3 the level averaged 225/134, and of group 4, 227/148. Also, these authors report blood pressure results in 74 per cent of group 3 and 100 per cent in group 4 as "temporary or poor." Their best results are in group 2, the group in which our poorest results were obtained. No analysis of mortality statistics is given.

Elsewhere Allen and Adson²² state: "Surgical treatment is advisable for patients who have hypertension, group 2 and group 3, if the hypertension is known to be progressive, if the function of the heart and kidneys is good and if the value of the blood pressures become normal or approximately normal as a result of rest or sleep, or following the intravenous injection of pentothal sodium, or following the administration of sodium amylal or the nitrites. Hypertension, group 4, does not respond satisfactorily to surgical treatment." It becomes obvious from these statements that the results in the study of Allen and Adson are not directly comparable to those in our series because of the lower average blood pressure levels and the lesser severity of retinal changes in their cases.

On critical reexamination of the statistics presented in this study several important facts relative to the treatment of essential and malignant hypertension come to light. Foremost among these is the fact that bilateral supradiaphragmatic splanchnicectomy and lower dorsal sympathetic ganglionectomy (apparently alone of all reported methods of treatment) offers hope of prolonged survival to persons suffering from malignant hypertension (1 out of every 3 patients survived five years or longer). In addition, patients with a very high level of blood pressure, angiospastic retinitis, severe

21. Ryland, D. A., and Holman, Emile: Arterial Hypertension and Section of the Splanchnic Nerves, *Arch. Int. Med.* **67**: 1-24 (Jan.) 1941.

22. Allen, E. V., and Adson, A. W., cited by Wagener, H. P., and Keith, N. M.: Diffuse Arteriolar Disease with Hypertension and the Associated Retinal Lesions, *Medicine* **18**: 317-430, 1939.

symptoms and a definite decrease in renal and cardiac function also are given a considerably better prognosis than has heretofore been demonstrated. Patients with retinal arteriolar sclerosis, however, seem to survive, after operation, no longer than those treated medically.

It would seem, then, that patients with essential hypertension fall logically into four distinct groups based on fundusoscopic observations alone: those with normal fundi (proposed group 1); those with retinal arteriolar sclerosis (proposed group 2); those with definite angiospasm plus varying degrees of arteriolar sclerosis (proposed group 3), and those with papilledema (proposed group 4). Within each of the last three groups the cases may be subdivided into degrees of severity, i. e. minimal, moderate, marked or severe. This classification has the advantage that it is reached objectively from examination of the ocular fundi and does not include such variables as symptoms, level of the blood pressure and degree of organic damage.

The ultimate prognosis in terms of survival is best (aside from those with normal fundi) for those showing retinal arteriolar sclerosis when treated medically (our group 2, Keith groups 1 and 2). With surgery, however, the ultimate prognosis for those with retinal arteriolar angiospasm (our group 3, Keith group 3) becomes better than that for the above group, and the patients with papilledema (our group 4, Keith group 4, those with malignant hypertension) are removed from the category of "hopeless." The definitely better relative prognosis in the two latter groups following operation would seem probably to depend on the fact that angiospasm, with or without papilledema, indicates a physiologic process which is reversible by the operation not only in the arterioles of the ocular fundus but also on the arterioles elsewhere in the body.

Theoretically, the effects of bilateral supradiaphragmatic splanchnicectomy and lower dorsal sympathetic ganglionectomy could depend on a release of angiospasm in the kidneys of patients with essential hypertension by interruption of the sympathetic outflow to the renal vessels. The work of Goldblatt and many others has shown that renal ischemia in the experimental animal can produce hypertension which is practically identical with essential or malignant hypertension in man. This hypertension would seem to be due to a circulating pressor substance elaborated by the ischemic kidney. It is logical to suppose that, if angiospasm in the human kidney could be released, the resultant relief of the renal ischemia should decrease or abolish the production of the pressor substance. Our good results in patients with retinal angiospasm and our poorer results in those with arteriolar sclerosis lend credence to the theory of relief of renal ischemia as a basis for the operative treatment of hypertension since, most probably, the angiospasm in the kidney can be relieved whereas sclerosis represents an irreversible process.

The proof of this theory would seem to depend on the demonstration of renal ischemia in hypertensive patients and its relief in those successfully treated. In the laboratory of the Neurosurgical Service at the University Hospital (in conjunction with Dr. Piero Foa) we have tentatively corroborated the work of Smith²³ showing the presence of renal ischemia in patients with

hypertension by means of diodrast and inulin clearances. By means of follow-up studies we hope to demonstrate the presence or absence of any increase in renal blood flow following operation and its correlation with clinical results.

It is our impression, therefore, that fundusoscopic observations are of definite aid in the prognosis of the patient with essential hypertension presenting himself for operation. If angiospasm of the retinal arterioles is present alone, we feel that his prognosis, regardless of the level of blood pressure, is fairly good following operation and that it becomes less favorable as the degree of arteriolar sclerosis accompanying the angiospasm increases. This is true also in regard to the patient with the papilledema of malignant hypertension, which would seem to indicate a high degree of the angiospastic process, its reversibility depending on the degree of arteriolar sclerosis present. The patient with either primary (as seen usually in older patients) or complete postangiospastic retinal arteriolar sclerosis has much less to gain in terms of ultimate prognosis from the operation.

In this paper we have not emphasized symptomatic relief following operation. In certain instances we feel that the operation is justifiable regardless of the ultimate prognosis because of the definite symptomatic relief obtained in about 85 per cent of the patients operated on.

SUMMARY

Seventy-six consecutive patients with essential and malignant hypertension were operated on by bilateral splanchnicectomy and lower dorsal sympathectomy and were followed for from five to seven years.

All cases were classified preoperatively according to the four groups suggested by Keith, based on retinal changes.

Mortality statistics of each group over the five to seven year period are compared with a similarly classified control group treated medically and described by Wagener and Keith.

Statistical results of operation are also presented in regard to blood pressure reduction, retinal changes and relief of symptoms and incapacitation following operation.

Patients with essential hypertension should be classified into four groups according to ocular fundus findings: group 1, normal fundi; group 2, arteriolar sclerosis without angiospasm; group 3, unmistakable angiospasm with or without varying degrees of arteriolar sclerosis, with or without hemorrhages and exudates; group 4, papilledema.

CONCLUSIONS

1. The prognosis of patients with a high level of blood pressure and angiospastic changes of the retinal arterioles is much more favorable following operation than following medical treatment.

2. The surgical treatment of patients with malignant hypertension has resulted in a survival of 33 per cent after five years, whereas following medical treatment in the control series the mortality was more than 99 per cent.

3. In general, a favorable prognosis following operation seems to depend on a minimal degree of retinal arteriolar sclerosis rather than on the level of blood pressure, or the absence of retinitis with hemorrhages and exudates, or papilledema.

23. Smith, H. W.; Goldring, W.; Chasis, H., and Ranges, H. A.: Observations on the Effective Renal Blood Flow and Functional Excretory Mass in Man, with Special Reference to Essential Hypertension, *Am. J. Physiol.*, **123**: 189-190, 1938. Goldring, W.; Chasis, H.; Ranges, H. A., and Smith, H. W.: Effective Renal Blood Flow and Functional Excretory Mass in Essential Hypertension, *J. Clin. Investigation* **17**: 505, 1938.

DOUBLE UTERUS WITH PREGNANCY

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In the last six years I have seen 11 patients¹ with more or less complete duplex anomalies of the utero-vaginal tract, each of whom has had one or more pregnancies (a total of thirty-two). The present discussion applies strictly to the association of the two conditions; no attempt is made to present embryologic or purely gynecologic considerations, and my approach is from the clinical rather than from the academic side.

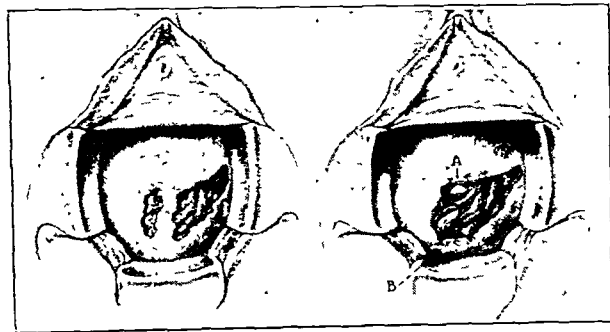


Fig. 1 (case 10).—Left, septate double cervix with rudimentary double uterus; the cervical anomaly is visible—distended in front of the descending head; right, the septum A to B has been excised as indicated.

Briefly, duplex anomalies of the uterovaginal tract are due to (1) irregularities of fusion involving the normal junction of the müllerian ducts to form the symmetrical halves of the corpus of the uterus and (2) irregularities in canalization involving the urogenital sinus or lower uterine and vaginal tracts. The most common anomaly is simple uterus arcuatus, departing little from the normal contours and hence not as often important clinically. I have not included such cases.

The misfortunes that occur to these patients may too often be laid directly at the gynecologist's door. A single case report will illustrate:

CASE 7.—An attractive healthy girl with a definitely limited intelligence had a vaginal septum removed at the age of 19, at which time there was a clinical notation made of two cervical openings. She immediately became pregnant and was delivered by a physician who did not recognize the anomaly. From this time on to the present she has been treated by nine physicians. She has had two healthy children at term; she has had extramarital gonorrhea with pelvic involvement; she has had two pelvic laparotomies and one miscarriage at five months; she is now a prostitute of the better class.

I have collected the complete records in this unusual case. More incorrect than correct diagnoses were made by the nine physicians. She was unnecessarily pounded, thumped, curetted, aborted and laparotomized, mainly because of a complete double uterus which presented diagnostic difficulties during pregnancy.

Duplex anomalies of the uterus and even of the vagina are seldom brought to the patient's attention prior to complete sexual activity. Menstrual disturbances are not infrequent and, requiring examination, may call

attention to such conditions. Resultant hematometra is a rare occurrence and hematoocolpos has been noted. On the other hand, duplex anomalies are frequently not noted until intercourse is begun, and occasionally not then. Out of 5 patients with double vagina in this series only 2 were aware of the duplex anomaly prior to examination by a physician. In 1 instance, to be sure, the husband had made the discovery and stated that the available functional variant was a definite asset to his marital relations. This is certainly a rare instance, one might almost say, of legal polygamy.

Frequently neither the onset of menstruation nor marriage calls attention to the double uterus. Unexplained abortion or miscarriage often leads to its discovery. Although a few of these patients may have difficulty in becoming pregnant (cases 5 and 6), my experience in general coincides with that of Norman Miller,² Falls³ and Findley⁴ to the effect that fertility is definitely not impaired. In fact, one is almost tempted to infer that fertility and the sex urge are distributed among these women in the same generous ratio as their organic sex equipment.

In the group of 11 patients there were thirty-two pregnancies, of which seventeen (53 per cent) resulted in abortion or miscarriage. Reasons for the frequency of spontaneous abortion and miscarriage seem fairly obvious. Intrauterine septums and irregularities of the fundus are poorly vascularized, the musculature is thin and irregularly disposed and the stroma is inadequate.

Uterine inertia, occasionally serious, is described as a common occurrence at labor. In fifteen deliveries in our group, however, it was noted only three times. Mechanical disarrangement of muscle fibers logically results in dysfunction of uterine muscle action. Expulsive force may be insufficient to effect delivery. More often, the chief difficulty involves failure in the mechanism of cervical dilation. I have observed almost the entire function of dilation in a double cervix. Figures 1 and 2 (case 10) illustrate the condition noted at the first vaginal examination shortly after the onset of labor. The septum A-B was removed at this time and the anomaly clearly outlined. The cervix from then on was watched or palpated almost constantly throughout the remainder of the labor. There was no other obvious reason for dystocia, yet this labor was exceedingly tedious. Even when the head was finally forcibly pushed into the cervix by the fundic musculature, one

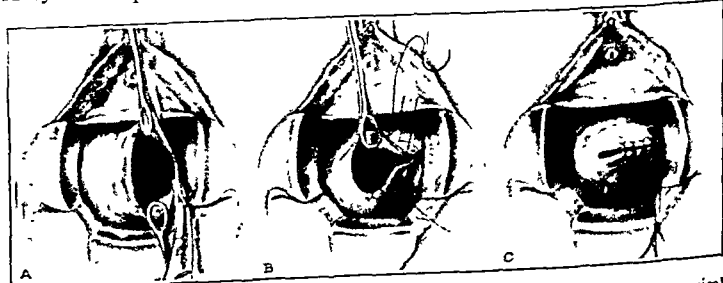


Fig. 2 (case 10).—A, excision of the septum created a single, irregular cervical orifice. After delivery the edges to the left were freshened and (B and C) sutured to form a single, normal appearing cervical opening.

sensed a fault or slowness in the mechanism of cervical effacement and dilatation. Following delivery, the cervix was repaired as indicated in figure 2. Now, three months post partum, the patient has a fairly normal appearing cervix.

Read before the Section on Obstetrics and Gynecology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 6, 1941.

1. Seven in my practice, 4 in the Department of Obstetrics and Gynecology, University of Oregon Medical School and Multnomah County Hospital.

2. Miller, N. F.: *Am. J. Obst. & Gynec.* 4: 398 (Oct.) 1922.
3. Falls, F. H.: *Am. J. Obst. & Gynec.* 15: 399 (March) 1928.
4. Findley, Palmer: *Am. J. Obst. & Gynec.* 12: 318 (Sept.) 1926.

Weakness or dangerous irregularity of the uterine wall may be present. Rupture of the uterus has occurred, but not frequently. It did not occur in our series. The pregnant horn may be expected to be embarrassed by the nonpregnant horn, pretty much as it might be by a subserous fibroid or other intimately attached growth. My experience, and that of most careful observers, indicates that the nonpregnant horn itself is not responsible for radical complications as often as one might expect. Occasionally it is retained in the pelvis, swings posteriorly and becomes a source of serious dystocia. Rarely it is twisted or incarcerated and may necessitate radical intervention. Frequently it contributes to fundic irregularities which are responsible for malposition of the fetus. The latter complications, however, are recognizable and their dangers may generally be circumvented. Out of fifteen deliveries, four

actual size. In 1 instance its enlargement was scarcely appreciable at three months.

Decidua is laid down in the nonpregnant horn. It is more nearly normal and therefore considerably greater



Fig 4 (case 8)—Appearance of partial transverse or oblique septum as drawn in figure 3 D. The inset clarifies the condition

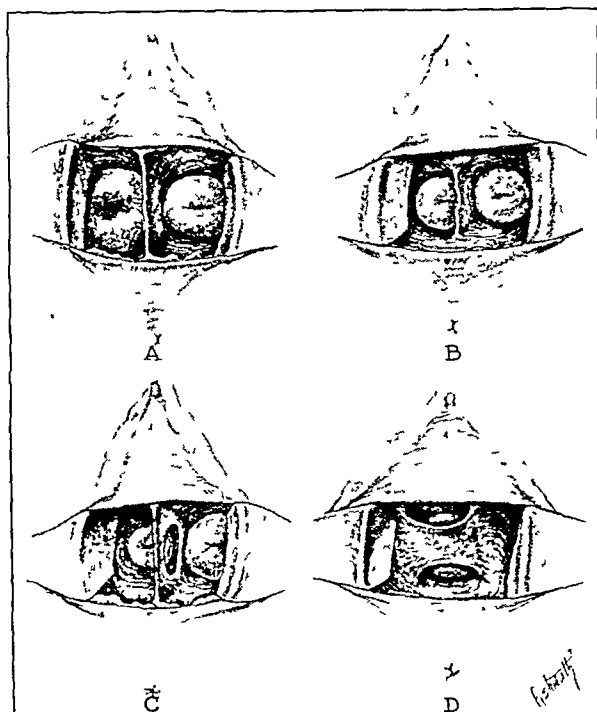


Fig 3—Types of vaginal septums noted in our patients. A, typical complete midline vaginal septum with double cervix and uterus (case 6). B, partial midline septum with double cervix and double uterus (case 5). C, midline septum with fenestra, double cervix and double uterus (case 2). D, partial transverse or oblique septum with single cervix and double uterus (case 8).

were breech, all with satisfactory outcome. In 2 patients (cases 9 and 11), 1 now under observation, I have been able to follow meticulously the disposal of the nonpregnant horn by abdominal and vaginal examinations. In both instances it has been carried well out of harm's way by the sixth month. Others state that, even though it remains deep in the pelvis, it may not necessarily cause absolute dystocia or serious harm. Such danger, however, exists and is to be kept constantly in mind.

The physiology of the nonpregnant horn is of interest. Its changes are in most respects similar to those which occur in the uterus itself during ectopic pregnancy. Its actual enlargement is described variously as from twice to three times its normal size. I have examined such uteri in 5 instances (cases 2, 9 [twice], 10 and 11) at between four and eight months. I do not believe that the accessory uterus often more than doubles its

in total volume than that ordinarily laid down in ectopic pregnancy. This point is important in relation to the problem of its expulsion post partum, which is occasionally serious. I believe that it is important to realize that this decidua is subject to the same hormonal influences which control the actual pregnancy. Such a uterus, then, may not be expected to bleed normally at any time during the pregnancy. When irregular

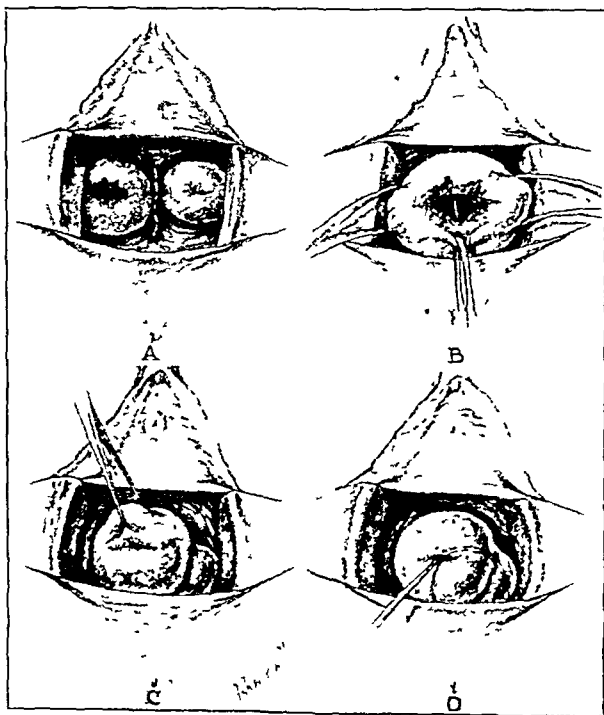


Fig 5—A, typical double cervix with double uterus. The remains of the excised vaginal septum are visible between the two cervices (case 6). B, single wide transverse external os with complete double uterus above. Uterine septum visible at level of internal os (case 8). C, two obliquely placed cervical openings with double uterus (case 10). D, obliquely placed cervical openings with single uterus. Curved sounds passed in the right and out the left cervical opening (case 4).

bleeding occurs, it should be considered as reflecting damage to the chorionic tissue of the pregnancy itself and should call for the same measures indicated by any

threatened abortion. It occurred three times in fifteen successful pregnancies in this group and consistently in those who miscarried.

DIAGNOSIS

History.—Too often both the patient and her physician may not appreciate the presence of double uterus or even of double vagina. Early diagnosis of double uterus was missed more often than it was made in our series. Diagnostic points in the history will be mainly by inference. Menstrual irregularities are not uncommon and dyspareunia is occasionally a symptom. It should be recalled that repeated unexplained abortion or miscarriage is to be suspected. It is a mistake to regard a history of normal pregnancy and delivery as excluding the diagnosis. Unexplained repeated breech or transverse position may also be suggestive. Bleeding during pregnancy is named by some as characteristic. It has not been so in this series and, in any event, should not be regarded as a casual symptom.

Physical Examination.—Patients even with the complete anomaly seldom show external stigmas. Vaginal septums are of many varieties and may easily be misinterpreted as artefacts resulting from previous childbirth trauma. The remains of vaginal septums are particularly likely to be misinterpreted in this way. Almost any sort of septal anomaly may occur. Those which I have seen are illustrated in figure 3. It should be noted that the septum is by no means always the typical midline anteroposterior type and is often incomplete. Any notable irregularity of the vaginal wall

but is by no means always present. The two cervices in some instances may be obliquely placed, as occurred in 2 of the cases (figs. 5 B and C). Again there may be a single comparatively free cervical opening, the cervical and uterine septum beginning within the external

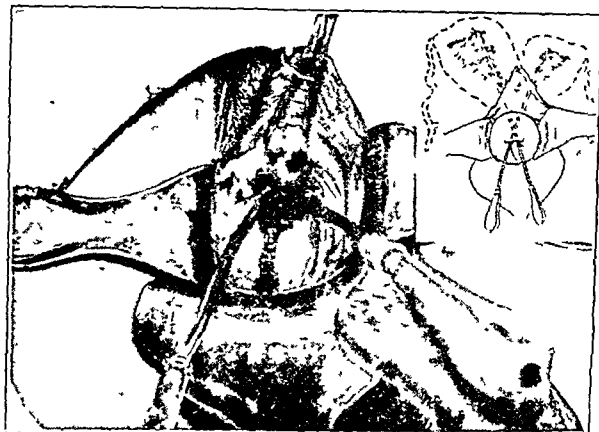


Fig. 7 (case 8)—A single cervix with complete double uterus (see also figure 3D). The sounds passed through a single cervical canal, crossed and separated widely at a septum which could be clearly delineated and entered widely separated uterine horns, as indicated in the inset. Oil escaped so freely that the tubes could not be filled.

os as in case 8 (figs. 5 B and 7). Such a condition may be mistaken for cervical distortion due to childbirth tears.

Metal sounds, while they cannot be used in pregnancy, are of the greatest assistance in enabling one to gain a correct concept of the actual situation within the cervix and uterus. In case 4, for example (fig. 5 D), a sharply curved sound passed into one external os could be brought out at the other external os. In case 6 (fig. 6), sounds passed into the two uteri through cervixes side by side were felt to click together clearly about an inch and one-half within. In case 8 (figs. 7, 9 and 5 B), sounds passed through a single cervix crossed and separated widely at a septum which could be clearly delineated and entered widely separated uterine horns, as indicated in the inset. Such information is helpful and easy to obtain.

Unfortunately, simple bimanual pelvic examination is not apt to clarify the situation in the absence of other suggestive manifestations in the lower tract. In pregnancy any tumor attached to the uterus and rapidly increasing in size should be suspected. Ectopic pregnancy may be difficult to exclude, but other unexplained tumors associated with pregnancy are not frequently to be confused.

Uterosalingograms yield the most complete information but are not advisable in cases of pregnancy or if adnexal infection is to be differentiated. The injection of iodized oil frequently presents some technical difficulties but has offered invaluable information. The procedure was done seven times in this study, and the resulting roentgenograms are those presented in the illustrations. Figure 8 illustrates the appearance found in case 5 in which an ectopic tubal pregnancy was removed with the right tube. Figure 9 (case 8) illustrates a double uterus in a patient with polypoid endometriosis. She had had two normal children and three miscarriages. Both uteri were curetted and showed similar endometriums.

Management.—The first consideration involves the advisability of allowing or advising patients with frank anomalies of this sort to become pregnant. It should



Fig. 6 (case 6)—The uterosalingogram shows double cervix and double uterus with normal patent tubes. Inset clarifies the condition. The window between the two uteri allowed the escape of iodized poppy seed oil back into the vagina until the left cervix was plugged. A satisfactory picture was then obtained. Inset indicates how this diagnosis was made by sound prior to injection of the iodized oil.

should suggest the possibility of double anomaly elsewhere in the tract.

Double cervix is often first suggested by a vaginal anomaly and should be easily recognized. The typical bilateral anomaly is illustrated in figure 5 A (case 6)

be recalled that fertility is generally high but that the incidence of abortion and miscarriage is also high. With reference to complete double uterus, the usual concern felt in relation to abortion or miscarriage is definitely increased by the possibility of harm from the nonpregnant uterus. The 11 patients whom I have seen have had seventeen abortions and miscarriages, none with serious permanent harm. They have had fifteen pregnancies successfully terminated. My experience then substantiates the opinion of Falls, Miller and Findley and others that if the patient is willing to assume the additional dangers of pregnancy under such circumstances she should be allowed to. Naturally, patients who have already delivered successfully should not be denied subsequent pregnancies—at least one or perhaps two.

Elective operative sterilization should be justified only by serious results from past pregnancies or other pathologic conditions which indicate the operation. There is seldom a correct indication to remove an accessory uterine horn—at least in the interest of later pregnancies, and pregnancy in such a crippled uterus should be considered precarious. The advisability of obliterating an intrauterine septum by excision or electrosurgery is questionable.

In the care of the pregnancy unusual precautions should be observed against the tendency to frequent abortion or miscarriage. Beside the usual precautions, wheat germ oil derivatives and progesterone may be indicated. The occurrence of bleeding and especially of bleeding with cramps is never to be regarded as

the location and general characteristics of the accessory uterine horn, if possible. If it is recognized early in pregnancy, it can frequently be identified throughout, especially if it threatens to be a dystocic factor because of its deep pelvic station.



Fig 9 (case 8)—Double uterus with single cervix in a patient with polypoid endometriosis who had had two normal pregnancies and deliveries and two miscarriages. Similar curettings were obtained from the two uteri (see also figures 3 D and 7).

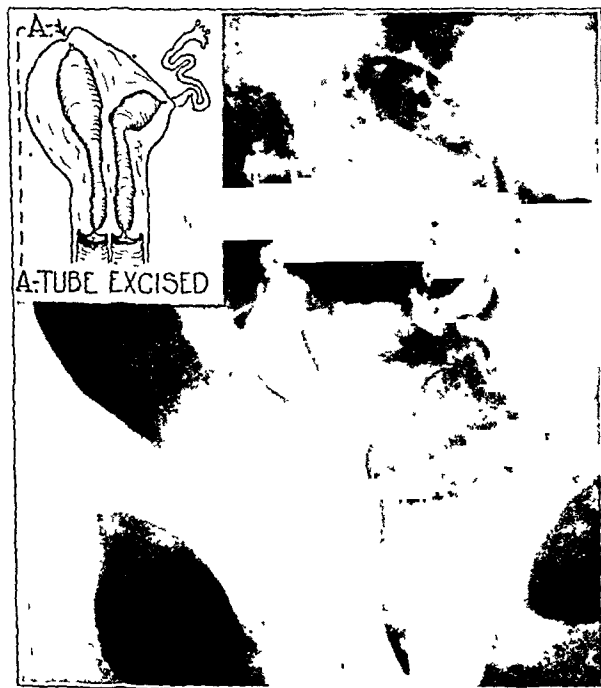


Fig 8 (case 5)—The uterosalpingogram shows a complete double uterus six weeks after an ectopic pregnancy in the right tube had been removed. The right tube is absent, the left tube filled. These uteri had to be injected one after another in very rapid sequence to obtain a satisfactory picture.

harmless because it may be thought to originate in the accessory uterus.

In the later months of pregnancy the uterus should be kept under the most careful surveillance. Malpositions of the fetus due to irregularities of contour of the fundus are frequent. Also, it is important to follow

During labor the possibility of weakened uterine musculature should be constantly borne in mind—the patient being hospitalized at once when contractions begin. Preparation for section, particularly in the case of a first delivery, should be complete.

Operative equipment should be available for the plastic management of vaginal and cervical anomalies. Their management is seldom described as complicated and has not been so in my experience. These anomalies are most often clearly delineated early in labor and in general may be easily dealt with—most often by simple excision of the septums. The time to do this is when the descending fetus has clearly delineated the actual necessity. At such a time the cervix will be thinned out and relatively avascular, and the necessary attention to the vagina will be visible and obvious. In general, no great concern need be felt in this connection. Should serious complications arise suddenly, cesarean section should be an available recourse.

Difficulties in the third stage should be anticipated but frequently do not occur. An adherent placenta caused by infarct or an unsatisfactory basis may present difficulties. Hemorrhage may occur from this source and also from uterine inertia resulting in retarded involution. Occasionally disposal of the heavy decidua from the accessory uterus may create a definite complication in the early puerperium. Such difficulties have not been prominent in the labor records of my patients.

SUMMARY

1. In the last six years 11 patients with duplex anomalies of the uterovaginal tract have been seen. Each has had one or more pregnancies—a total of thirty-two.

2. Failure to diagnose these conditions often results in harm to the pregnant patient. Helpful diagnostic points may be menstrual irregularity, dyspareunia, repeated unexplained abortion or miscarriage and repeated malposition of the fetus. Bleeding during pregnancy is not to be regarded as a casual symptom.

3. The use of two uterine sounds is most helpful in diagnosis. Uterosalingograms yield the most complete information available. Six of my patients were so studied (roentgenograms are shown).

4. Fertility in this group is high, but miscarriage and abortion are also frequent. Our 11 patients had thirty-two pregnancies—with seventeen abortions (53 per cent). Most patients may be allowed to become pregnant but must be made to understand the potential difficulties. Efforts to correct such conditions by surgery in the interest of later pregnancy are of doubtful validity.

5. Care of the pregnancy demands general and special measures to strengthen and protect the ovular attachment. The progress of the nonpregnant horn is to be followed as carefully as possible. My experience in this connection has been of interest.

6. At delivery, operative equipment for the management of vaginal and cervical anomalies, and for cesarean section if indicated, should be immediately available. Adherent placenta, hemorrhage from faulty involution and other irregularities may characterize the third stage and early puerperium.

548 Medical Arts Building.

ABSTRACT OF DISCUSSION

DR. NORMAN F. MILLER, Ann Arbor, Mich.: Dr. Schauffler is to be commended for bringing this subject before us. The malformation is not a common one, but it occurs with sufficient frequency to merit attention, especially when one realizes that many of these patients come with a history of mismanagement due usually to misunderstanding. Some years ago I reported 54 cases of true uterus didelphys collected from the literature and 1 from our own clinic. There are three times in life when the presence of this malformation is likely to be noted. First, at adolescence, when some menstrual disturbance brings the patient for examination and the anomaly is discovered. Second, at the time of marriage, either because of dyspareunia or some other marital difficulty or in the course of a premarital examination. Third, it may be discovered by the physician during pregnancy, at the time of antepartum examination or during labor. While Dr. Schauffler's cases are mostly examples of uterus didelphys, case 7 appears to be better classified as an ordinary double uterus. In reporting these cases it would seem wiser to adhere to one type of malformation, as the type makes a difference in evaluating the incidence of complications. Generally the more extensive the malformation the higher the incidence of complication. In my experience labor was complicated, first, through interference with the presenting part; second, because of faulty power, and, third, by retention complications. Hemorrhage was not common. I subscribe to Dr. Schauffler's conservative attitude regarding the management of these cases. Sixty per cent of patients with this complication who become pregnant are likely to go to term, and 30 per cent of those who go to term have complications of some sort, the complication frequently being a minor one. Pregnancy need not be restricted in these patients. Fertility is usually not impaired and, as has been pointed out, the complications that do occur can be adequately taken care of provided the lesion is recognized. One must keep in mind that pregnancy may occur in both uterine horns. When this happens we probably have an indication for double cesarean section. Any anomaly of the lower generative tract should suggest the possibility of some malformation higher up.

DR. GOODRICH C. SCHAUFFLER, Portland, Ore.: Perhaps a psychologic factor is responsible for many of these misdiagnoses; the fact that we do not keep the condition in mind is

responsible for many misdiagnoses. If we have any value in this presentation, it is perhaps a reemphasis of the simple and more available diagnostic measures. I refer specifically to the use of sounds and careful vaginal and cervical examination technic. Perhaps some of you have had the unfortunate experience of curetting a patient for therapeutic termination of pregnancy and having the patient go serenely on without terminating. We have all seen such cases and I believe that not infrequently it is the result of the invasion of an unsuspected nonpregnant horn of a double uterus. Also I believe occasionally a pregnancy in both horns may be responsible for such a condition; in fact, it has been reported more than once. Also in an elderly woman the invasion of such a double uterus for the diagnosis of cancer may give false results, owing to the revision of the wrong uterus by the cure.

SULFATHIAZOLE FOR ACUTE DIARRHEA AND DYSENTERY OF INFANTS AND CHILDREN

MERLIN L. COOPER, M.D.

RALPH L. ZUCKER, M.D.

AND

STEWART WAGONER, M.D.

STATISTICAL ANALYSES BY MRS. ESTELLE W. BROWN
AND RUTH BENNETT, M.D.

CINCINNATI

Previous studies on mice by one of us (M. L. C.)¹ showed that one dose of 2 mg. of sulfathiazole or sulfapyridine administered by stomach tube three hours after the animals were infected with *Shigella paradysenteriae* (dysentery bacilli) resulted in survival of all mice inoculated with two minimum fatal doses, survival of the majority of mice inoculated with 100 minimum fatal doses and survival of a few mice inoculated with 1,000 minimum fatal doses.²

Sulfathiazole was employed because our experience with the sulfonamide drugs indicated that sulfathiazole was tolerated better than sulfapyridine and also because our earlier experiments on mice showed that sulfathiazole and sulfapyridine were equally effective therapeutically. This study was started before sulfaguanidine became available, and the use of sulfathiazole was continued until a sufficient number of observations had been obtained from which conclusions could be drawn.

All patients were classified on admission into certain age groups: from birth to 6 months, from 6 months to 1 year, from 1 to 2 years, from 2 to 4 years, and over 4 years. Every other patient in each age group was treated with sulfathiazole.² The dose was 2 grains per pound (0.13 Gm. per 454 Gm.) of body weight a day administered by mouth. One half of the dose calculated for the first twenty-four hours was given as the initial dose. Subsequent doses were administered every four hours and each consisted of one sixth of the calculated dose for twenty-four hours. Administration of the drug was continued for three days after the patient's temperature became normal.

Special history sheets were prepared and pertinent information was recorded on them daily. The treatment of these patients consisted of that customary in our hospitals. Frequent determinations were made of the carbon dioxide combining power of the blood serum, and, when indicated, sodium bicarbonate was admin-

From the Children's Hospital Research Foundation and the Department of Pediatrics of the University of Cincinnati College of Medicine.
1. Cooper, Merlin L., and Keller, Helen M.: *J. Pediat.* 18: 450-468 (April) 1941.

2. Supplied by E. R. Squibb & Sons.

istered. Blood transfusions were given when they would appear to be helpful, and parenteral fluids were administered when dehydration existed. Two stools were obtained for culture, usually within eight hours after the patient was admitted to the hospital. All stools were cultured on at least two Petri dishes each of sodium desoxycholate citrate medium, MacConkey's medium and S-S (Difco) medium. Suspicious colonies were picked and identified culturally and at times serologically. The details of the culture studies will be reported separately.

In order to evaluate the drug therapy, four factors were chosen for comparison, a procedure which largely obviated the question of individual judgment. These factors were (1) the length of time from admission until the patient's temperature became normal, (2) the length of time from admission until the patient's temperature became less than 100 F. (rectal), (3) the length of time from admission until the stools became normal and (4) the length of time from admission until the patient had apparently completely recovered or all symptoms had disappeared.

AGE DISTRIBUTION OF PATIENTS

In table 1 it is seen that there was a total of 123 patients studied from the Cincinnati General Hospital and the Children's Hospital. Fifty-nine, or 47.9 per cent, had *S. paradysesteriae* in their stools, which was the approximate incidence found in our previous study.³ The incidence of dysentery in the respective age groups in the present study (table 1) increased from 19.5 per cent in patients in the first six months of life to 91.6 per cent in the group over 4 years of age.

STATISTICAL ANALYSIS OF DRUG THERAPY

A statistical analysis of the 64 patients whose stools were negative for *S. paradysesteriae* is seen in table 2. The mean days for the four factors chosen for analysis are compared in the control and the treated group. It

TABLE 1—Age Distribution and Incidence of Dysentery

Patients	By Culture		By Age	Per Cent Positive by Age
	Positive	Negative		
First 6 months	0	17	46	19.5
Second 6 months	14	19	33	42.4
Second year	17	0	33	73.0
3 and 4 years	0	1	10	90.0
Over 4 years	11	1	12	91.6
Total	59	64	123	47.9

TABLE 2—Sixty-Four Patients Whose Stools Were Negative for *Shigella Paradysesteriae*

Mean Days from	Control	Treated	Value of P*
Onset to admission.....	62	74	0.6
Admission to normal temperature	67	73	0.6-0.5
Admission to temperature less than 100 F.	47	54	0.7-0.6
Admission to normal stools	38	53	0.9-0.8
Admission to recovery	81	91	0.5

* If P is 0.05 or less, the difference between the two groups may be considered significant.

is seen first that there was no significant difference in the mean days from onset of infection to admission to the hospital in the control and treated groups. This demonstrates that, for this important variable, these two groups were satisfactory for study. It is observed, as regards the four factors, that the value of P in each

instance was far too great to indicate a significant difference. These findings led to the conclusion that the treated group of patients whose stools did not contain *S. paradysesteriae* derived no appreciable benefit from the drug.

The data from the statistical analysis of the 59 patients whose stools contained *S. paradysesteriae* and

TABLE 3—Fifty-Nine Patients Whose Stools Were Positive for *Shigella Paradysesteriae*

Mean Days from	Control	Treated	Value of P*
Onset to admission.....	61	41	0.7-0.6
Admission to normal temperature	106	52	0.01-0.001
Admission to temperature less than 100 F.	78	35	0.02-0.01
Admission to normal stools	112	47	<0.001
Admission to recovery	127	70	0.01-0.001

* If P is 0.05 or less, the difference between the two groups may be considered significant.

TABLE 4—Total Group of One Hundred and Twenty-Three Patients

Mean Days from	Control	Treated	Value of P*
Onset to admission.....	62	59	0.9-0.8
Admission to normal temperature	88	64	0.05-0.02
Admission to temperature less than 100 F.	63	45	0.1-0.05
Admission to normal stools	85	52	0.01-0.001
Admission to recovery	105	81	>0.05

* If P is 0.05 or less, the difference between the two groups may be considered significant.

who had clinical dysentery are seen in table 3. Again it is noted that there was no significant difference in the mean days from onset of illness to admission to the hospital in the control and the treated patients, indicating that this was a satisfactory group of patients for such a study. The comparison of the control and the treated group from the standpoint of the four factors chosen for analysis shows, in each instance, a decidedly significant difference in favor of the treated group as judged from the value of P. It is interesting that sulfathiazole was effective only in the treatment of patients whose stool cultures were positive for *S. paradysesteriae*.

In table 4 all 123 patients, those with and those without dysentery, are compared after being divided into control and treated groups. The value for P for each of the four factors is significant and in favor of the patients treated with sulfathiazole. These significant differences are not so well defined, however, as are those obtained when only the dysentery patients are considered (table 3). This lessened significance is accounted for by the inclusion into this group of the nondysentery patients who did not derive benefit from the sulfathiazole.

A statistical analysis of the duration of illness among the control and the treated patients is seen in table 5, in which the patients are compared on the basis of stool cultures being positive or negative for *S. paradysesteriae*. It is to be noted that both groups were satisfactory for such a study (as judged by the value of P for the duration of illness from onset to admission to the hospital). If the control patients are considered first, it is seen that the value of P for three of the four factors is significant and in favor of the patients whose stool cultures were negative. The value of P was 0.08 for the fourth factor (the length of time from admission to the time when the temperature became less than 100 F.); this figure, although slightly above the upper limit of significance (0.05), would be considered acceptable by many statisticians. The interesting point is that the

³ Cooper, Merlin L., Furcolow, M. L.; Mitchell, A. Graeme, and Cullen, Glenn E. *J. Pediat.* 15: 172-182 (Aug.) 1939

significant difference in duration of illness is in favor of the patients with negative stools, indicating that they were sick a shorter time than were those patients whose stool cultures were positive for *S. paratyphoides* when neither group received sulfathiazole. When the patients

TABLE 5.—Duration of Illness in the Control and Sulfathiazole Treated Patients with Positive and Negative Stool Cultures

Mean Days	Control			Sulfathiazole		
	Posi- tive	Nega- tive	P*	Posi- tive	Nega- tive	P*
Onset to admission.....	6.1	6.2	0.90	4.0	7.4	0.23
Admission to normal temperature	10.5	6.7	0.04	5.1	7.3	0.12
Admission to temperature less than 100 F.	7.8	4.7	0.08	3.5	5.4	0.16
Admission to normal stools.....	11.2	5.8	0.005	4.7	5.5	0.47
Admission to recovery.....	12.7	8.1	0.012	7.0	9.1	0.17

* If P is 0.05 or less, the difference between the two groups may be considered significant.

who received sulfathiazole are considered, it is seen that there was no significant difference in duration of illness between those whose stool cultures were positive for *S. paratyphoides* and those whose stool cultures were negative. This absence of any significant difference was due to the shortening of the period of illness among the patients with positive stool cultures as a result of treatment with sulfathiazole. This point of view, together with the information seen in table 3 in which the treated and the untreated patients with positive stools are compared, emphasizes the fact that the drug was effective only in the patients with positive stools.

The patients in this study were not so acutely ill as those reported in a previous study.³ It was desirable to know whether the patients in the present study had been seen earlier in the course of their illness. A comparison of the mean days from onset to admission in these two groups (table 6) shows that there was no significant difference in the days of illness before admission to the hospital, indicating that the patients in the present study did not receive hospital care any earlier than the previous and more acutely ill group.

The fatality rate among the patients in this study was lower than that in any group previously studied. There were 6 deaths, and 5 of these were among patients whose stool cultures were negative. Only 1 of the patients who died received sulfathiazole, and he was given the drug late in the course of his illness. Five of the deaths occurred in children under 5 months of age and 4 of the 6 had been sick less than one week before admission to the hospital.

TABLE 6.—Mean Days from Onset to Admission Among Patients in the Years 1940 and 1938

Patients	1940	1938*	P
Negative stool cultures.....	6.8	8.3	0.22
Positive stool cultures.....	5.2	6.2	0.57

* Onset to first stool, which was usually the day of admission.

Symptoms of drug reactions were noted in 6 patients. Of these, 2 showed microscopic hematuria on the third and seventh days of therapy respectively, at which times drug administration was stopped. In 4 other patients cutaneous lesions similar to erythema nodosum developed, a type of drug reaction apparently peculiar to sulfathiazole. These lesions as well as the hematuria disappeared promptly when drug therapy was stopped.

A comparison of the condition of the patients during the period they were in the hospital is seen in table 7. More patients whose stool cultures were negative were classified as being in a "poor" and "serious" condition, while more of those whose stool cultures were positive were classified as in "good" and "fair" condition. More patients treated with sulfathiazole were classified as being in a "poor" and "serious" condition, while more of those who did not receive the drug were in a "good" and "fair" condition.

In this study we are not justified in drawing any conclusion regarding the influence of sulfathiazole therapy on the disappearance of *S. paratyphoides* from the stools, since no organized effort was made to obtain repeated stool cultures at regular intervals. However, the data (table 8) show that there was an average of three and two-tenths stools examined per patient in the group which received sulfathiazole and four and three-tenths stools per patient in the group which did not receive sulfathiazole. Only 1 of 17 patients treated with sulfathiazole still had a positive stool culture when discharged from the hospital. In comparison, 17, or 50

TABLE 7.—Condition of Patients While in the Hospital

	Patients			
	Good	Fair	Poor	Serious
By disease				
Negative stool.....	6	16	36	6
Positive stool.....	10	32	15	2
By treatment				
Sulfathiazole.....	5	21	29	4
No sulfathiazole.....	11	27	22	4

TABLE 8.—Influence of Sulfathiazole on the Disappearance of *Shigella Paratyphoides* from the Stools

	Sulfathiazole		No Sulfathiazole	
	Patients	Stools Cultured	Patients	Stools Cultured
Stools became negative.....	16	53	17	79
Stools did not become negative...	1	2	17	69
Totals.....	17	55	34	148

per cent, of 34 patients who did not receive the drug still had positive stool cultures at the time they were discharged from the hospital.⁴

SUMMARY

The stools of 59, or 47.9 per cent, of 123 patients suffering from acute diarrhea were positive for *S. paratyphoides*, Flexner and Sonne.

All patients were classified into age groups on admission to the hospital, and every other patient in each age group was treated with sulfathiazole.

Four factors were chosen for statistical analysis and evaluation of the drug therapy. These factors were (1) the length of time from admission to the hospital until the patient's temperature became normal, (2) the length of time from admission until the patient's temperature became less than 100 F. (rectal), (3) the length of time from admission until the stools became normal and (4) the length of time from admission until the patient had apparently completely recovered.

Statistical analysis showed that sulfathiazole was of therapeutic value in patients whose stools were positive for *S. paratyphoides* but was without demonstrable

4. Since this material was submitted for publication a similar study has been instituted in which sulfaquinidine is being used, and the results will be published in the near future.

effect in the treatment of patients whose stools were negative for *S. paratyphosae*.

Six patients died. Five of these had negative stool cultures. Only 1 of these 6 patients received sulfathiazole, and in this instance the drug was started late. Four of the patients who died had been sick less than a week when admitted to the hospital.

Our data indicate that sulfathiazole hastens the disappearance of *S. paratyphosae* from the stools of the treated patients.

Seventeen of 34 patients who did not receive sulfathiazole had positive stool cultures when discharged from the hospital, while only 1 of 17 patients treated with sulfathiazole had a positive stool culture at the time of discharge.

Elland Avenue and Bethesda.

ALCOHOL AND THE PEDESTRIAN IN TRAFFIC ACCIDENTS

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AND

ALEXANDER O. GETTLER, Ph.D.

NEW YORK

From time to time, publications have appeared on the effect of alcohol on the driving efficiency of operators of motor vehicles. Attempts have been made to correlate the amount of alcohol in the blood, urine or expired air of drivers in traffic accidents and to determine the lowest quantity of the intoxicant in blood, urine and expired air above which it would be reasonably safe to infer that an impairment of reactions and reflexes would occur. Among the observers who have studied this problem are Schwarz,¹ Heise,² Carlson,³ Naville and Rosselet,⁴ Turner⁵ and Selesnick.⁶ The Committee on Tests for Intoxication of the National Safety Council⁷ has recommended that "all persons having a level of alcohol in the blood above 0.15 per cent by weight are sufficiently impaired to be unsafe drivers."

With the exception of work by Gerber,⁸ who found a blood alcohol concentration above 0.15 per cent in 37.3 per cent of 314 pedestrians who were killed in traffic accidents, and our published studies,⁹ we have been unable to find any reference in the literature on the relation of alcohol to fatal and nonfatal accidents involving pedestrians.

In an attempt to add to the meager data on this phase of the subject and to obtain information on the relation of alcohol to violent deaths other than traffic fatalities, a large number of quantitative alcohol determinations on all types of violent deaths were carried

out as a routine measure for a number of years. Tables 2 and 3 represent that part of the study which is concerned with fatal traffic accidents.

In a study of 6,000 fatal accidents, some related and others unrelated to trauma, Gettler and Tiber,¹⁰ taking into consideration the clinical histories, attempted to classify the relation of the physiologic effects to the alcohol content of the brain (table 1).

It is evident from table 1 that the brain alcohol content of persons who have partaken of a beverage containing alcohol ranges from 0.005 and 0.6 per cent. Occasionally figures above 0.6 per cent have been observed. During the past twenty years only 1 case has been encountered in which the brain alcohol content has been as high as 0.9 per cent.

An analysis of the table indicates that practically no abnormal physiologic effects occur in persons having a brain alcohol content below 0.1 per cent (1 plus).

Persons with a brain alcohol content of above 0.1 per cent and up to 0.25 per cent (2 plus) exhibited definite physiologic disturbances, as indicated in the table. In a majority of this group unbalanced equilibrium, staggering gait or other signs commonly indicative of "drunkenness" were absent. In some of the cases in which these phenomena were observed, values between 0.2 per cent and 0.25 per cent were obtained.

According to our studies, persons having a brain alcohol content of 0.25 per cent or more showed definite evidences of intoxication. By the term "intoxication" is meant unstable equilibrium, disturbances of the various faculties and incoordination resulting in a staggering gait. That this is true was demonstrated by Gettler and Freireich,¹¹ whether the person is a habitué or an abstainer, male or female, young or old, robust or sickly, and is based on the amount of alcohol present in the brain and not on the quantity of alcohol consumed by the person nor on the amount of alcohol found in the gastrointestinal tract. It is common knowledge that one person may become "dead drunk" from a given quantity of whisky while another person from the same quantity may show little or no effect. It is exactly for this reason that we are not concerned with how much alcohol the person has consumed nor how much is present in the gastrointestinal tract but emphasize that the brain or liver must be used for analysis in fatal cases. It is a well known fact that tolerance to alcohol depends on the rapidity with which the substance is oxidized in the tissues. A habitué has ordinarily acquired this property of oxidation to a high degree. If the same quantity of alcohol is consumed by an abstainer and a habitué, the rapidity of the oxidation process in the habitué prevents its accumulation in the brain to a greater degree than in the abstainer. Therefore the abstainer may show signs of intoxication while the habitué will remain apparently sober. The analysis of the brain will bear out this contention, namely the abstainer showing a large amount (3 plus) and the habitué considerably less, or 1 plus. Should the habitué continue to take alcohol, manifestations of intoxication may develop and a chemical analysis may reveal, after death, a brain alcohol content of 3 plus or more.

ANALYTIC PROCEDURES

Organs Best Adapted for Determining Alcohol Intoxication.—It is evident at the outset that the alcoholic content of the stomach and intestine is of no value

10. Gettler, A. O., and Tiber, A.: *Arch. Path. & Lab. Med.* 3: 218 (Feb.) 1927.

11. Gettler, A. O., and Freireich, A. W.: *Am. J. Surg.* 27: 328 (Feb.) 1935.

From the chemical laboratories of the Chief Medical Examiner's Office of New York City.

1. Schwarz, Fritz: Some Experiences in the Quantitative Determination of Alcohol Content of the Blood, *Schweiz. med. Wchnschr.* 67: 54 (Jan. 16) 1937; abstr., *J. A. M. A.* 108: 767 (Feb. 27) 1937.

2. Heise, H. A.: Alcohol and Automobile Accidents, *J. A. M. A.* 102: 739-741 (Sept. 8) 1934.

3. Carlson, A. J.: Criteria of Acute Alcohol Intoxication, *Science* 80: 546 (Dec. 14) 1934.

4. Naville, F., and Rosselet, E.: Difficultés et erreurs dans le diagnostic de la cause des morts dites "naturelles," *Rev. méd. de la Suisse Rom.* 48: 742-749 (Sept. 10) 1928.

5. Turner, R. G.: Blood Alcohol and Its Relation to Intoxication in Man, *Proc. Soc. Exper. Biol. & Med.* 32: 1548-1552 (June) 1935.

6. Selesnick, Sydney: Alcoholic Intoxication, Its Diagnosis and Medicolegal Implications, *J. A. M. A.* 110: 775-778 (March 12) 1938.

7. Committee on Tests for Intoxication, National Safety Council, Chicago, Chemical Tests for Intoxication, Oct. 12, 1938, p. 12.

8. Gerber, S. R., Coroner, County of Cuyahoga, Cleveland: Personal communication to the authors, June 18, 1941.

9. Gonzales, T. A.: Annual Reports for 1935, 1936 and 1937 of the Office of Chief Medical Examiner, New York City, in the Report of Committee on Tests for Intoxication, National Safety Council, Chicago, Oct. 12, 1938, p. 5.

as an index of intoxication, for the reason that alcohol has no effect on the person until absorbed into the circulation. The alcohol in the gastrointestinal tract is still outside of the body proper, and its presence merely indicates that alcohol had been consumed, but it can in no way be taken as an index of intoxication.

TABLE 1—Classification of Alcoholics¹⁰

Alcohol Content of Brain, per Cent		Physiologic Effect
Trace	0 005 0 02	No noticeable effect
+	0 02 0 10	Somewhat stimulated, no other noticeable effect
++	0 10 0 25	Decreased inhibitions, emotional instability, loss of sense of care, impulsive or reticent response and
+++	0 25 0 40	Unstable equilibrium, disturbed senses, slurred speech, staggering gait
++++	0 40 0 60	Deeply intoxicated, pronounced difficulty in locomotion, alcoholic coma

In several thousand fatal accidents the liver, brain, lungs, kidneys, spleen, spinal fluid, blood and urine were analyzed for alcohol. When the premortem history was compared with the alcoholic content of the organs analyzed in each case, it was revealed that the brain and the spinal fluid gave the best and most consistent indication of the degree to which the alcohol had influenced the subject in question. This is to be expected, as the condition of intoxication is caused by the action of the alcohol on the brain centers.

In cases in which the brain is not available, the liver may be used. It must be remembered, however, that the alcohol content of the liver may be a little higher (during the first hour of the absorptive period) or

TABLE 2—Fatal Vehicle Accidents (New York City Ten Year Period) Classified According to Alcoholic Content of the Brain or Liver

	Total Number of Cases	Alcohol Content of Brain					
		Absent	Traces	0 02 to 0 1%	0 1 to 0 25%	0 25 to 0 40%	0 40 to 0 60%
Pedestrians	2,472	1,637	74	111	208	797	45
Subway and "L" road trains (falls from station platforms and run over)	421	180	10	26	59	138	8
Drivers of passenger cars	214	85	9	13	51	50	6
Chauffeurs of trucks	44	38	2	2	1	1	
Operators of motorcycles	36	29	1	2	1	3	
Drivers of horse drawn vehicles	11	6	..	3	.	1	1
Passengers in motor vehicles	273	142	6	26	59	56	4
Totals	3,471	2,119	102	183	359	644	64

Children under 15 years of age and adults who survived twenty four hours or more subsequent to the accident are not included in this table

somewhat lower (postabsorptive period) than that of the brain. The difference between the alcohol content of the brain and of the liver is rarely more than 0.05 per cent. Between the second, third and fourth hour after the last drink has been taken, the alcoholic content of the brain and of the liver are practically the same.

In living persons the spinal fluid or the blood is preferred as a test medium to that of urine or expired air.

The Method in Detail.—The brain, as soon as it is removed from the skull, is put into a clean receptacle, tightly covered and placed in a refrigerator. When ice cold, 500 Gm. is weighed out, quickly ground up and placed in a 2 liter flask; to this 600 cc. of water, 5 cc. of a saturated solution of tartaric acid and 1 cc. of white liquid petrolatum are added. The mixture is now distilled with steam. A long, well cooled condenser should be used, and the distillation should be continued until exactly 800 cc. has been collected. The distillate is well mixed and used in the following procedures.

Qualitative Detection.—Ten cc. of the distillate is put into a test tube. A copper spiral (10 turns of 14 gage copper wire) is heated red hot and plunged into the liquid. This is repeated ten times, the contents of the test tube being kept cool by allowing cold water to run over the test tube during the entire procedure. The copper oxide formed on the surface of the spiral during the heating oxidizes the alcohol, if present, to acetaldehyde. Four cc. of the oxidized distillate (when cool) is placed into a small test tube, and 0.5 cc. of

TABLE 3.—Percentage of Cases in Fatal Automobile Accidents in Each of the Four Stages of Intoxication

	Total Number of Cases	+	++	+++	++++	Percentage Under the Influence of Alcohol
Pedestrians in fatal automobile accidents	2,472	4 5%	8 4%	16 0%	1 8%	30 7
Pedestrians in fatal elevated or subway train accidents	421	6 2	14 0	32 8	1 9	51 9
Drivers of passenger cars	214	6 1	24 0	23 4	3 0	56 5
Chauffeurs of trucks	44	4 5	2 3	2 3	.	9 1
Operators of motorcycles	36	5 6	2 7	8 3	.	16 6
Drivers of horse drawn vehicles	11	27 3	.	9 1	9 1	45 5
Passengers in motor vehicles	273	5 5	14 3	20 5	1 4	45 7

a colorless reduced fuchsin solution¹² is added. After it has been allowed to stand for fifteen minutes the development of a red color indicates that alcohol is present. If it remains colorless, no alcohol is present and the directions that follow are omitted.

Quantitative Determination.—Twenty Gm. of potassium bichromate and 40 cc. of concentrated sulfuric acid are placed in a 500 cc. Kjeldahl flask. Three hundred cc. of the distillate previously obtained is now added and the contents are well mixed. The flask is then connected to a long, well cooled condenser by means of a Hopkins distilling head and the distillation started. The heat must be so regulated that it will take from forty-five to fifty minutes to collect exactly 250 cc. of distillate. After being thoroughly mixed, 50 cc. of this distillate is titrated with 0.05 normal sodium hydroxide solution, phenolphthalein being used as an indicator. From this titration figure, the percentage of alcohol present may be calculated as follows:¹⁰ (cc. of 0.05 normal alkali used — 1.32) × 0.007.

In the analysis of blood or spinal fluid, 10 cc. together with about 1 Gm. of paraffin is placed in a 100 cc. distillation flask which is then set up for steam distillation. The flask containing the blood or spinal fluid is not

¹² Dissolve 0.5 Gm of fuchsin (basic) in 200 cc of distilled water, add an aqueous solution of sulfur dioxide, the quantity corresponding to 1 Gm. of sulfur dioxide gas, allow to stand until the solution assumes an amber color (this requires about one hour). If 100 much sulfur dioxide is added, the solution is valueless after two days. If properly prepared, the fuchsin solution keeps well for several weeks.

heated. The steam alone is used for the distillation. One hundred cc. of distillate is collected. To this 100 cc. of distillate, placed in a 200 cc. round bottom flask, are added 7.5 Gm. of potassium dichromate and 15 cc. of concentrated sulfuric acid. The flask is connected to a long, well cooled condenser by means of a Hopkins distilling head. The contents are well mixed. A medium sized (1½ inch) Bunsen flame is applied, so that the distillation is not too rapid. The distillation should be at a slow but constant rate. It should take about sixty minutes to collect the required 80 cc. of distillate. When exactly 80 cc. has been collected, the distillate is well mixed and aliquot portions are titrated with 0.05 normal sodium hydroxide for the acetic acid produced. A small part of this distillate should be tested for the sulfate ion in order to be sure that no sulfur trioxide has passed into the distillate. If this procedure is followed, there should be absolutely no danger of sulfur trioxide being distilled. From the amount of acetic acid found by titration, the amount of ethyl alcohol is calculated as follows:¹³

Per cent alcohol = (cc. of 0.05 normal alkali needed for entire 80 cc. of oxidized distillate — 0.42) × 0.027.

By means of the methods described, 3,471 highway fatalities of all types covering a period from Jan. 1, 1928 to Dec. 31, 1937 were investigated. All cases were analyzed for methyl (wood) alcohol and, if it was present, were not included in this report. During this decade 6,911 necropsies were performed in a total of 12,897 highway deaths. The patients on whom tests were not made, and hence were not included in this investigation, were children under 15 years of age, adults who survived twenty-four hours or more subsequent to the accident (when any alcohol which might have been present at the time of the accident would have become completely oxidized and eliminated), and persons on whom for various other reasons the tests were considered unnecessary. Table 2 presents a classification of the 3,471 fatal vehicular accidents, on a basis of their alcohol content.

It will be noted from table 2 that the largest number of persons involved in accidents and having alcohol in their systems fall within the 2 plus and 3 plus groups. It may be assumed that the reason for this is that persons in the 1 plus group are hardly affected, if at all, while in the 4 plus group intoxication is usually so profound that locomotion is practically lost; in fact the majority are in a condition of alcoholic coma.

Table 3 classifies the total number of fatal accidents according to the percentage of cases in each of the four stages of intoxication.

The total number of fatalities of drivers (258) to that of pedestrians (2,893) indicates a ratio of 1 to 11. It is obvious that the driver is much better protected than the pedestrian and therefore less liable to fatal injuries. The greater percentage of brain alcohol content in intoxicated drivers who have met with fatal accidents may be accounted for by the smaller number of total fatalities in the drivers.

CONCLUSIONS

In evaluating the public health and medicolegal implications of highway accidents, the relation of alcohol to pedestrian deaths should not be ignored. The greater number of pedestrian fatalities as compared with the driver deaths and the results recorded in table 3, which indicate that 30.7 per cent of the pedestrians were

under the influence of alcohol and that 26.2 per cent had an alcohol content of 2 plus or more, emphasize the importance of this observation. Negligence on the part of the intoxicated pedestrian is also an important factor. The decreased inhibitions, deficient sense of care, impaired reaction time and slow response to stimuli of the intoxicated pedestrian tend to create a disregard for safety and for the proper observance of traffic regulations.

While this investigation was conducted in a city the population of which represents only a small proportion of the total population in the country, the figures obtained should be fairly representative of conditions in other large communities and should stimulate similar investigations elsewhere. Furthermore, the results of the investigations would be valuable in conjunction with other public health educational efforts in the reduction of fatal and nonfatal traffic accidents.

125 Worth Street.

THE PRODUCTION OF EXPERIMENTAL OSTEOMYELITIS

PRELIMINARY REPORT

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We present herewith a preliminary report on our experimental production of a lesion simulating human osteomyelitis. We are able to keep the animals alive for an indefinite period.

For years attempts have been made to reproduce in animals lesions of bones resembling human osteomyelitis. These experimental efforts have taught us much about the pathogenesis of the disease. That osteomyelitis is an infectious disease was early recognized. Beginning with Rodet¹ in 1884, *Staphylococcus aureus* was used to produce experimental lesions in bone. Rodet, and others shortly after him, produced abscesses in bones by injecting the organisms intravenously. Some years later Lexer² studied osteomyelitis extensively from the anatomic and pathologic points of view. His description of the circulation in the long bones stands unaltered. He recognized early that osteomyelitis was a hematogenous infection. Lexer produced bone abscesses by the injection of small amounts of attenuated bacterial cultures intravenously and noted that only in this way could the animals be kept alive and subsequently contract pathologic changes in the bone. Larger doses and more virulent cultures invariably caused death early in young animals and suppurative arthritis in older animals. Lexer stated that it was impossible by intravenous injection of staphylococci to produce an acute progressive medullary phlegmon.

This work has been amply corroborated, and there have been many reports of attempts to produce osteomyelitis in experimental animals by this means or some

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In addition to those mentioned elsewhere, we received encouragement, assistance and guidance from Drs. Ludwig Hektoen, Edwin W. Ryerson, Hollis Potter, C. Howard Hatcher, Robert A. Arens and especially Dallas B. Phemister.

1. Rodet, A.: *Compt. rend. Acad. d. sc.* 99: 569, 1885

2. Lexer, Erich: *Experimental Production of Osteomyelitis Foci*, *Arch. f. klin. Chir.* 48: 181, 1894, 52: 576, 1896; *Experiments with Osteomyelitis*, *ibid.* 53: 2666, 1896, 57: 879, 1899

13. Gettler, A. O., and Freireich, A. W.: *J. Biol. Chem.* 92: 199 (July) 1931.

modifications of it. Haldeman,³ Starr,⁴ Thompson and Dubos⁵ and many others have injected staphylococci and other organisms both intravenously and directly into the bone and have claimed that they produced osteomyelitic lesions.

We have studied these various reports carefully and have repeated much of the work ourselves. We feel, however, that in the bone lesions which we and others have produced by these technics there are many points of dissimilarity to osteomyelitis as we see it clinically in the human subject. One cannot produce by these means a destructive lesion which is progressive. Moreover the suppuration is largely confined rather sharply to the site of inoculation or to the point where bacteria localize. We have repeatedly injected cultures virulent for the rabbit into the tibia without producing any demonstrable lesion or, at most, a small localized abscess. On intravenous injection of these bacteria we find that most of the animals die within a few days and that, along with abscesses in the liver, kidneys or spleen, one finds an occasional bone abscess. We have never obtained consistent results as reported

by Thompson and Dubos. We have carried out many experiments in an attempt to induce a certain degree of immunity and hypersensitivity to whole bacteria and their products and have in no way modified our results.

Never does one find massive destruction of an entire shaft or extensive periosteal reaction, or any definite formation of sequestrum and involucrum. For the most part the animals rarely live longer than a week, and there is no opportunity for associated experimentation.

Certain definite facts have been established with regard to the pathogenesis of osteomyelitis. Hobo⁶ has enlarged on experiments of Lexer and Koch and has shown that after the intravenous injection of bacteria the organisms tend to localize particularly in the metaphysis, the epiphysis

and the subperiosteal vascular regions. Hobo mentions the paucity of phagocytic elements in the metaphysis and also the anatomic arrangement of the blood vessels

in this region, which is conducive to the slowing of the stream, both factors lending themselves to propagation of the organisms and development of infection.

Wilensky⁷ emphasizes the importance of vascular thrombosis in the pathogenesis of osteomyelitis. He calls attention to the resemblance between the roent-

genogram of aseptic necrosis of a long bone and that seen in some forms of osteomyelitis when the main nutrient vessel is involved in a thrombotic process. Phemister⁸ in discussing aseptic necrosis of bone calls attention to vascular occlusion as a possible element in the pathogenesis of osteomyelitis.

Robertson⁹ has reviewed the subject of osteomyelitis thoroughly and emphasizes that trauma is by no means a factor necessary to the production of inflammatory centers in bone but calls particular attention to the fact that epiphyses bear the brunt of injuring stresses in children, even to the point of separation, as is the case in

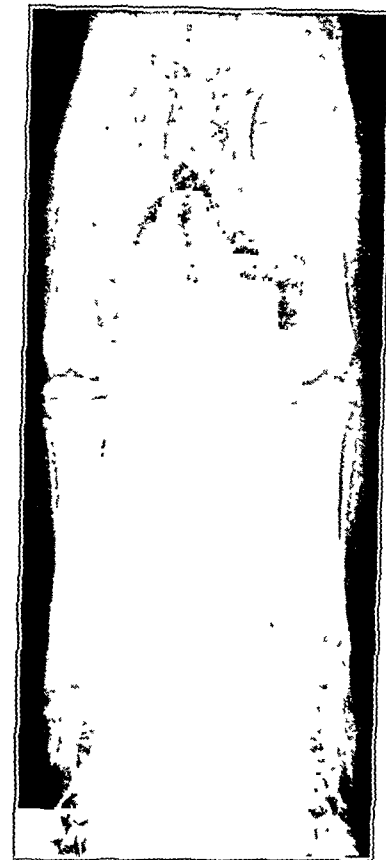


Fig 2—Appearance two weeks after in jection of the right tibial metaphysis with 0.3 cc of sodium morrhuate. Note changes due to aseptic necrosis.

more mature bones. Trauma insufficient to cause epiphysal separation undoubtedly produces hemorrhage with injury to cells and the resulting *locus minoris resistentiae*. With a "seeding" infection elsewhere the combination of factors may well cause an osteomyelitis.

In describing the past efforts to produce experimental osteomyelitis, Wilensky summarizes the reasons for failure and calls attention particularly to the difficulty in preparing the local field properly for embolus-thrombus formation. It is with the latter factor that we concerned ourselves in an effort to produce a true experimental osteomyelitis.

EXPERIMENTAL METHOD

Young rabbits of 2 to 2 3/4 pounds (900 to 1,020 Gm.) were used as the experimental animals. By injecting between 0.3 and 0.4 cc. of 5 per cent sodium morrhuate directly into the metaphysis of the tibia with a 23 gage

3. Haldeman, Keene O. Acute Osteomyelitis. Clinical and Experimental Study. Surg., Gynec. & Obst. 59: 25-31 (July) 1934.

4. Starr, C. L. Acute Hematogenous Osteomyelitis. Arch Surg 42: 567-587 (May) 1922.

5. Thompson, R. H. S., and Dubos, R. J. Production of Experimental Osteomyelitis in Rabbits by Intravenous Injection of Staphylococcus Aureus. J. Exper. Med. 68: 191, 1938.

6. Hobo, Teruo. Zur Pathogenese der akuten haematogenen Osteomyelitis. Acta scholae med. univ. imp. in Kyoto 4: 1 (March) 1921.

7. Wilensky, A. O. Osteomyelitis. Its Pathogenesis, Symptomatology and Treatment. New York, Macmillan Company, 1934. Correlation of Roentgenographic Evidence with Clinical and Pathological Facts in Acute Osteomyelitis. Am J Roentgenol 16: 123-133 (Aug.) 1926. Mechanism of Bacterial Infection. Arch Surg 13: 228-261 (Aug.) 1926. Pathogenesis of End Results of Lesions of Acute Osteomyelitis. Ann Surg 84: 651-662 (Nov.) 1926. Mechanism and Pathogenesis of Acute Osteomyelitis. Am J Surg 3: 281-289 (Sept.) 1927.

8. Phemister, D. B. Changes in Bones and Joints Resulting from Interruption of Circulation. Arch Surg 41: 436-472 (Aug.) 1940.

9. Robertson, D. E. Acute Hematogenous Osteomyelitis. J. Bone & Joint Surg 9: 8-23, 1927.

needle we hoped to produce sufficient vascular impairment in the bone to permit the growth of bacteria and the production of a lesion in bone. The animals were divided into the following groups:

A. Controls, which received from 0.3 to 0.4 cc. of sodium morrhuate alone into the tibial metaphysis.

B. Controls to determine whether the culture used in groups C to E would produce an osteomyelitis following injection into the bone or intravenously without preparing the bone field. This group does not include the many rabbits similarly injected prior to the experiments herein reported and referred to in our introductory remarks. The upper tibiae of 3 rabbits were injected with 0.2 cc. of a 1:50 dilution of a twenty-four hour broth culture of *Staph. aureus*. Two rabbits received an injection of 0.2 cc. of a 1:100 dilution of a twenty-four hour broth culture of *Staph. aureus* intravenously.

C. Animals which received between 0.3 and 0.4 cc. of sodium morrhuate into the tibial metaphysis and one hour later 0.2 cc. of a 1:50 dilution of an eighteen to twenty-four hour broth culture of *Staph. aureus* into the same metaphysis. Of this group six animals received sodium morrhuate in both legs but culture only into the right tibia. The remainder received morrhuate and culture into the right tibia alone.

D. Animals which received from 0.3 to 0.4 cc. of sodium morrhuate directly into one tibial metaphysis



Fig. 3.—Section of region of tibial metaphysis ($\times 52$) three weeks after injection of sodium morrhuate and *Staphylococcus aureus* as noted in C under experimental method. Note bone necrosis and purulent exudate.

and 0.2 cc. of a 1:100 dilution of an eighteen to twenty-four hour broth culture of *Staph. aureus* intravenously.

E. A group of animals which received an initial subcutaneous infection and one week later 0.3 cc. of sodium morrhuate into one tibial metaphysis followed in one hour by 0.2 cc. of a 1:50 dilution of a twenty-four hour broth culture of *Staph. aureus* into the same metaphysis. This group was a subsequent development in an attempt to produce some degree of immunity, enabling us to keep the animals alive for a longer period.

The broth culture used was one which was originally obtained from a patient with hematogenous osteomyelitis and subsequently was passed through many rabbits.

The animals were observed from day to day for palpable swelling and were roentgenographed at weekly intervals. Involved bones were saved for microscopic



Fig. 4.—Region of osteoid columns of tibial metaphysis ($\times 100$) four days after injection of sodium morrhuate. Note paucity of cellular elements in and about the osteoid tissue and irregular appearance of columns.

section when the animals died or were killed. Heart blood cultures were made on death, and also cultures from the involved bone.

RESULTS

A. Seven young rabbits served as controls. One tibia of each animal was injected with sodium morrhuate. Of these, 2 died on the second and fourth days respectively. The remaining 5 lived from three to eight weeks. Of the latter group 3 showed no bony changes in roentgenograms taken at weekly intervals over a period of four weeks or more. Two showed rarefying changes, one of the metaphysis and one extending down the shaft, which were considered to be indicative of aseptic necrotic changes. The microscopic findings varied. For the most part necrobiotic changes could be noted in the subepiphyseal osteoid columns and in the marrow spaces, the latter being characterized by diminution in the cellular elements along with varying amounts of fibrotic change. Changes in bone trabeculae varied from practically none to considerable necrosis of metaphyseal and inner shaft trabeculae as evidenced by the lack of normal staining qualities and absence of cells from lacunar spaces. Actual vascular thrombosis was not a significant feature. Reparative changes were well advanced in three weeks.

B. Of 3 control animals that received a culture injection into one tibia, 1 died the day following inoculation. The remaining 2 died in nine and seventeen days respectively. Neither of these animals developed a suppurative lesion involving the metaphyseal bone. The 2 rabbits which received intravenous inoculation lived for twenty-two and twenty days respectively. At necropsy no bone infections were found. Both had abscesses in

the liver and kidneys, and *Staph. aureus* was recovered from the postmortem heart blood cultures.

C. This group, which received a preparatory injection of sodium morrhuate into the tibial metaphysis followed by an injection of staphylococcus culture consisted of 10 animals, 2 of which died the day following injection and 3 on the seventh, eighth and ninth days respectively. The remaining 5 lived between eleven and twenty-four days. Of the latter group 3 lived for approximately three weeks. All animals who lived longer than a week acquired lesions in the injected bone, interpreted as acute osteomyelitis. These lesions varied from multiple small abscesses with necrosis of trabeculae to massive necrosis of the entire shaft with formation of sequestrums and involucrums.

In some the infection involved the epiphysis with destruction of the epiphysal plate. Soft tissue abscesses were prominent and in nearly all there were large



Fig. 5.—Zone comparable to that in figure 4 ($\times 52$) twenty-four days after injection of sodium morrhuate. Note increased cellularity and appearance of active regeneration.

abscesses grossly, adjacent to the bone. The extent of the involvement depended apparently on the length of life of the animal. In 6 animals in which sodium morrhuate alone was also injected into the opposite tibia, clumps of bacteria were found in the metaphysis along with multiple abscesses. In 2 of the animals the degree of osteomyelitic involvement in the tibia which did not receive an original culture injection was more severe than that of the 1 that did. *Staph. aureus* was recovered from heart blood of all of the animals that died, and the same organism from the infected tibia.

D. Seven animals received *Staph. aureus* intravenously following the morrhuate injection into one tibial metaphysis. One animal died in two days and 2 in six and seven days respectively. Of the remaining animals 3 lived for approximately three weeks and 1 for twelve days. Of the animals that lived beyond a week, all acquired definite osteomyelitic lesions. In each case these lesions were characterized by extensive suppuration and sequestration. In 1 animal a

secondary osteomyelitis was present in the lower femur of the opposite leg. This developed during the third week of infection. Microscopically the lesions were characterized by extensive bony necrosis with numerous abscesses and considerable periosteal new bone formation. The lesions progressed from week to week. Of this group 2 of the animals were killed on the twenty-fourth day and might have been observed over a longer period. *Staph. aureus* was recovered from heart blood culture of all the animals that died and from the involved bone.

E. This group, which received a preliminary subcutaneous infection a week prior to inoculation of the tibia with sodium morrhuate and culture, consisted of 15 animals. Four of the animals died immediately after receiving the injection of sodium morrhuate into the bone. These were the only deaths attributable to the injection of this substance. Of the remaining animals 2 lived for three weeks, 2 for two weeks and 1 for nine days; of the remaining 6, 5 were killed at the end of three weeks and 1 at the end of seven weeks.

Every animal in this group, except the 4 which died following the sodium morrhuate injection, contracted acute osteomyelitis of varying degree. In each case there was extensive suppuration in the bone and soft tissues, in some instances involving the entire shaft with sequestration a prominent feature. There was considerable periosteal new bone formation, frequent occurrence of subperiosteal abscesses and often destruction of epiphysis and epiphysal plate. In several instances the adjacent fibula was involved in a definite osteomyelitic process.

COMMENT

It would seem that some degree of immunity is imparted to the rabbits used in group E which permits survival over a period of time necessary for the development of an extensive osteomyelitis. Roentgen evidence of bone necrosis is evident at the end of the first week following infection and thereafter is progressive with the formation of sequestrums and involucrums in two and a half to three weeks. Many of the roentgenograms of the morrhuate control animals show no evidence of bone inflammation or destruction at any time. However, it is evident from the microscopic sections that this substance when injected into bone produces aseptic necrosis of varying degree. Its action appears to be directly on the marrow elements and bone trabeculae rather than by vascular occlusion. We have noted little evidence of the latter. The rapidity of bone repair following sodium morrhuate injection is startling, being well advanced at the end of three weeks, and it is difficult to find evidence of necrosis in some sections.

Whatever its mechanism, sodium morrhuate produces a certain amount of aseptic necrosis of bone, and this is apparently the soil necessary for the inception of and propagation of an infection the end result of which is osteomyelitis. The roentgen and microscopic picture of bone injected with sodium morrhuate alone is that of aseptic necrosis of mild degree, while that with sodium morrhuate followed by bacterial inoculation is one of severe bone destruction and suppuration.

From the invariable occurrence of osteomyelitis in group E it can be seen that, subsequent to the preparation of the bone field with sodium morrhuate, bacteria which are implanted directly or reach it by the hematogenous route are enabled to grow and produce extensive destruction of bone which on roentgenograms and microscopic sections resembles closely the disease as encountered in the human being.

The circulation in bone being of the end artery type, it may well be that, in human osteomyelitis, thrombosis or embolism prepares the field for bacterial growth by producing necrosis of bone. Once started, the process extends itself by further thrombosis, necrosis and infection.

SUMMARY AND CONCLUSIONS

Following the injection of sodium morrhuate into the tibial metaphysis of rabbits, a tibial osteomyelitis develops subsequent to the intravenous or local introduction of *Staphylococcus aureus*. Slightly more than 70 per cent of the animals that receive an immunizing subcutaneous infection live for three weeks or more. Those of the latter group which were killed at the end of three weeks might have lived longer.

Rabbits treated in this manner uniformly acquire osteomyelitis of a degree varying directly with the period of survival.

This, therefore, is a reliable method of producing experimental osteomyelitis in rabbits, which will permit experimentation subsequent to its development.

55 East Washington Street.

THE TREATMENT OF MYASTHENIA GRAVIS BY REMOVAL OF THE THYMUS GLAND

PRELIMINARY REPORT

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Many observers have commented on the frequency of abnormalities of the thymus in patients with myasthenia gravis. Approximately one half of the reports of autopsies on patients with myasthenia gravis have contained descriptions of benign tumors, hyperplasia or persistence of the thymus. It is true, of course, that the autopsies on patients with myasthenia gravis are more apt to be reported if there is present some abnormality such as a tumor of the thymic region. On the other hand, it is likely that many small tumors or other abnormalities of the thymus have been overlooked at necropsy in a number of patients with myasthenia gravis. Norris¹ expressed the opinion that pathologic changes may be found in the thymus in cases of myasthenia gravis in direct ratio to the care with which they are sought.

The literature contains the descriptions of only a few attempts to influence the course of myasthenia gravis by surgical intervention. The first of these was a report by Schumacher and Roth² of an operation performed by Sauerbruch in 1912: A woman aged 21 had hyperthyroidism and myasthenia gravis. The important observations included the usual signs of hyperthyroidism and roentgenologic evidence of a mass in the anterior mediastinum. Three operations were performed. The first consisted of the ligation of the right superior thyroid artery and vein. An enlarged thymus

was removed through an incision in the neck at the second operation. A subtotal thyroidectomy was performed eighteen months later. The patient improved but was not cured of the myasthenia at the time of the report by Schumacher and Roth. Haberer³ included in his descriptions of operations on the thymus for other conditions a report of a partial thymectomy on a patient with myasthenia gravis. The operation was performed through an incision in the neck, and the thymus was described as being in a state of involution. When examined three years later, the patient appeared to be improved. The third and fourth patients were operated on by Sauerbruch and these operations were reported by Adler⁴ and by Obiditsch.⁵ In one of these, a benign thymic tumor the size of a child's head was removed and the patient died eight days later of mediastinitis. A tumor the size of a man's fist was removed from the other patient, who died five days later as a result of a streptococcal infection. Lièvre⁶ stated in 1936 that there existed no report of the successful removal of a thymoma.

The fifth instance of an attempt to influence the course of myasthenia by an operation on the thymus was reported by Blalock, Mason, Morgan and Riven⁷ in 1939, the operation having been performed three years previously. A cystic tumor was removed from the thymic region. No other thymic tissue was visualized, but the search of the anterior mediastinum was not a thorough one. This patient showed an early improvement and has been entirely well for four years. Campbell⁸ has recently removed thymomas from 2 patients with myasthenia gravis. One of them died suddenly two days after the operation. The second patient is improved but myasthenia gravis still persists, as is proved by the fact that a prostigmine preparation is required. The remaining report is that by Leriche and Jung⁹ of the removal of thymic tissue from a girl aged 16 years with myasthenia gravis. The incision was made in the neck well above the sternum. No improvement in the patient's condition was found two months after the operation.

The present attempt to influence the course of myasthenia gravis differs from those described in that the operation was performed with the deliberate purpose of removing all the thymic tissue by complete exploration of the mediastinum. The stimulus to try this procedure was based on several known facts. The abnormal physiology and pharmacology of this disease presents a picture similar to that of curare poisoning. It seemed reasonable to assume, then, that some particular tissue might be producing a substance similar in action to that of curare. That the thymus gland might be concerned in the production of such a substance was strongly suggested by the fact that the successful removal of a thymus tumor had been followed by a sustained remission of the disease in at least 1 instance. In addition, in a large majority of the cases carefully studied at autopsy some abnormality of the thymus has been found. As there is no other pathologic change

3. Haberer, H.: Zur klinischen Bedeutung der Thymusdrüse, Arch. f. klin. Chir. **109**: 193, 1917.

4. Adler, H.: Thymus und Myasthenie, Arch. f. klin. Chir. **189**: 529, 1937.

5. Obiditsch, R. A.: Beiträge zur Kenntnis der Thymusgeschwülste, im Besonderen derjenigen bei Myasthenie, Virchows Arch. f. path. Anat. **300**: 319, 1937.

6. Lièvre, J. A.: Peut-on tenter un traitement chirurgical de la myasthénie, Presse méd. **44**: 991 (June 10-17) 1936.

7. Blalock, Alfred; Mason, M. F.; Morgan, H. J., and Riven, S. S.: Myasthenia Gravis and Tumors of the Thymic Region, Ann. Surg. **110**: 544 (Oct.) 1939.

8. Campbell, Eldridge H., Jr.: Personal communication to the author, 1941.

9. Leriche, R. and Jung, A.: Thymectomie dans un cas de myasthénie, Mém. Acad. de chir. **65**: 334 (March 1) 1939.

From the Departments of Surgery and Medicine of Johns Hopkins University School of Medicine and the Johns Hopkins Hospital.

1. Norris, E. H.: The Thymoma and Thymic Hyperplasia in Myasthenia Gravis with Observations on the General Pathology, Am. J. Cancer **27**: 421 (July) 1936.

2. Schumacher and Roth: Thymektomie bei einem Fall von Morbus Basedowii mit Myasthenie, Mitt. a. d. Grenzgeb. d. Med. u. Chir. **25**: 746, 1912.

which occurs with such constancy, it was decided that a complete removal of all thymus tissue offered the best chance of altering the course of the disease and that a definite evaluation of the relation of this organ to the neuromuscular block present in myasthenia gravis should be made.

As there now exist methods of objective determination of the degree of severity of the myasthenic state on a quantitative basis, there can be no doubt whether or not improvement has taken place. Three methods of study have been employed in estimating the effect of thymectomy on the course of the disease: 1. A careful study has been made of the degree of weakness on a given dosage of a prostigmine salt and the degree of disability without any medication has been ascertained. 2. All patients have been carefully tested by the intra-arterial injection of prostigmine methylsulfate. It has been shown that in normal persons the injection of a small dose of prostigmine methylsulfate (0.1 to 0.5 mg.) into the brachial artery results in a profound weakness of the hand muscles as well as the appearance of numerous fasciculations.¹⁰ In 9 of 10 patients with myasthenia gravis using much larger doses (1.5 to 3 mg.), there was observed an increase in strength of the hand muscles and no fasciculations have been observed.¹¹ 3. Not only do quantitative studies of the state of neuromuscular conduction using the method described by Harvey and Masland¹² show the specific changes characteristic of the disease, but these changes are proportional to the severity of the disease and leave no doubt as to the degree of alteration which any therapeutic procedure produces. This block in neuromuscular transmission is restored to or toward normal by prostigmine and returns to its abnormal state as soon as the drug is withheld. In 1 case studied during a spontaneous remission this characteristic defect in neuromuscular conduction did not even disappear.¹³

A brief description follows of the history and physical observations, the operation and the preoperative and postoperative course of the 6 patients on whom thymectomy has been performed. There was no evidence on roentgen studies of a mediastinal tumor in any of the patients.

REPORT OF CASES

CASE 1.—P. C., a Negro aged 33, noticed the sudden onset of diplopia and weakness of his legs eight months before admission. One month later, after an infection of the upper respiratory tract, the weakness became generalized and increased to such an extent that he had been confined to bed when he entered the hospital. He could not lift his head from the pillow, roll over in bed, hold even the lightest object in his hand or lift his leg off the bed. Improvement was dramatic after prostigmine bromide, but a total daily oral dose of 240 mg. was required before he could get out of bed and feed himself. Roentgenograms showed no evidence of thymic enlargement. Three mg. of prostigmine methylsulfate injected into the right brachial artery caused great improvement in strength immediately, but no fasciculations were seen.

On July 26, 1941 a thymectomy was performed after the sternum had been divided. There was a fairly large tongue of thymic tissue which extended from the suprasternal region to

approximately the fifth costal cartilage. (Unfortunately we are unable to remember whether there were one or two lobes. In the remaining 5 cases there were two lobes.) There were no postoperative complications. Twenty-four hours later fasciculations were noticed in the tongue and arm muscles. He was given large doses of prostigmine for several days after the operation; the dose was gradually reduced, and he last received the drug on August 8.

The dosage of prostigmine bromide which he took prior to operation without any ill effects caused violent abdominal cramps and diarrhea when given several weeks following the operation. On August 30 1 mg. of prostigmine methylsulfate was injected into the brachial artery. There was still some gain in strength, but numerous fasciculations were visible and none had resulted from 2 and 3 mg. doses prior to operation.

The patient was discharged from the hospital on September 20. At the time of this report, which is two months after the operation, the patient is free of symptoms except for weakness of the hands, and no prostigmine has been given for seven weeks. His activity at present without drugs is greater than before operation when 240 mg. of prostigmine bromide a day was given. He no longer has diplopia or difficulty in swallowing. The legs have become quite strong and he is up and about all day.

CASE 2.—R. L., a white woman aged 28, a graduate student, with a typical picture of myasthenia gravis, had a sudden onset of diplopia and strabismus in August 1940. In October her legs grew weak and then her arm began to fatigue easily. A few weeks later she had difficulty with swallowing and her speech became nasal. In January 1941 the disease was diagnosed, and despite increasingly large doses of a prostigmine preparation her weakness grew progressively more severe. On admission she was taking, in addition to 1 Gm. of guanidine, six or seven 30 mg. doses of prostigmine bromide each day and still had ptosis, diplopia and nasal speech and was confined to bed because of weakness of the extremities. She was forced to take one or two doses of prostigmine bromide during the night because of difficulty in breathing. Roentgenograms of the chest showed no mediastinal mass. Fasciculations were not seen following the injection of 1.5 mg. of prostigmine methylsulfate into the brachial artery, and there was a great increase in strength of the hand muscles.

On August 4 a total extirpation of the thymus was performed. There were two long tongues of thymic tissue which extended from approximately the suprasternal region to the fifth costal cartilages. For several days after the operation she required large doses of prostigmine. Eight days after operation, the prostigmine dosage was reduced to half. Two weeks after the operation she required only 30 mg. orally each twenty-four hours. Twenty-two days postoperatively 0.6 mg. of prostigmine methylsulfate was injected intra-arterially. There was only a slight increase in strength and six to eight fasciculations a minute were observed. Since the twenty-fifth postoperative day she has required no medication.

Electromyographic studies on September 15 revealed that the action potential of the abductor digiti quinti muscle in response to a maximal stimulus applied to the ulnar nerve had risen from a preoperative level of 3.5 millivolts (while prostigmine was being given) to 5.8 millivolts without prostigmine. The daily variation in normal subjects has never exceeded 5 per cent; in this patient the gain was 60 per cent.

Her condition at present, seven weeks after the operation, is much better than her maximum improvement with the prostigmine salts before the thymus was removed. She talks more clearly, swallows without difficulty, reads and feeds herself and is again able to walk without assistance after nearly ten months in bed. Her feeling of fatigue after exercise is now a natural one in contrast to that before operation. The diplopia even on extreme lateral gaze has disappeared. Her improvement has been phenomenal, and it is her impression that she is making a total recovery.

CASE 3.—L. K., a Negro woman aged 22, contracted a febrile illness in August 1935 after which she first noticed generalized weakness most pronounced in the extremities, ptosis, diplopia, nasal speech and increasing difficulty in chewing and swallow-

10. Harvey, A. M.; Lilienthal, J. L., Jr., and Talbot, S. A.: On the Effects of the Intra-Arterial Injection of Acetylcholine and Prostigmine in Normal Man, to be submitted for publication in the Bulletin of the Johns Hopkins Hospital.

11. Harvey, A. M., and Lilienthal, J. L., Jr.: Observations on the Nature of Myasthenia Gravis: The Intra-Arterial Injection of Acetylcholine, Prostigmine and Adrenalin, to be submitted for publication in the Bulletin of the Johns Hopkins Hospital.

12. Harvey, A. M., and Masland, R. L.: A Method for the Study of Neuromuscular Transmission in Human Subjects, Bull. Johns Hopkins Hosp. 68: 81 (Jan.) 1941.

13. Harvey, A. M.; Lilienthal, J. L., Jr., and Talbot, S. A.: Observations on the Nature of Myasthenia Gravis: The Phenomena of Facilitation and Depression of Neuromuscular Transmission, to be submitted for publication in the Bulletin of the Johns Hopkins Hospital.

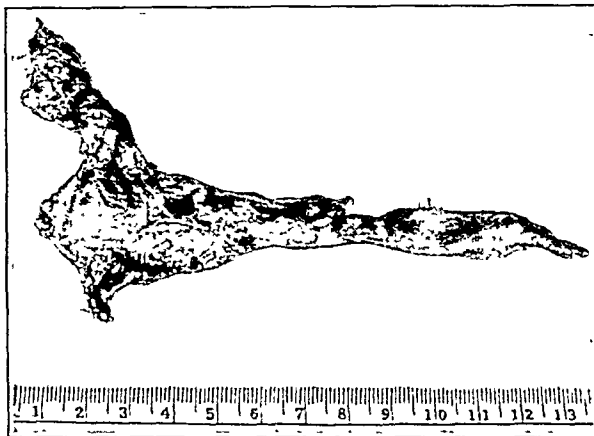
ing. She has had repeated infections of the upper respiratory tract, each of which resulted in an exacerbation of her symptoms. The symptoms were all improved by prostigmine. None of the other drugs used for the treatment of myasthenia gravis have afforded any relief, and during the last year, while she was taking 15 mg. of prostigmine bromide every two hours (105 to 120 mg. a day), her activities were nevertheless severely limited by weakness. Prior to operation, the intra-arterial injection of prostigmine methylsulfate produced a significant increase in local strength but no fasciculations. On Aug. 18, 1941, the thymus was removed (right lobe: 9 by 2.5 by 0.8 cm.; left lobe: 15 by 2.5 by 0.8 cm.). The left lobe is shown in the illustration. Her postoperative course was marked by a rise of temperature to 103 F. on the third postoperative day. On September 6 intra-arterial prostigmine methylsulfate produced a moderate increase in strength locally, and in addition there were numerous fasciculations in the injected arm. On September 18 she required only 15 mg. of prostigmine bromide four times a day and on this reduced dosage was definitely stronger than before the operation. By September 24 her daily dose of prostigmine bromide was only 30 mg. a day, given in four divided doses, and on this regimen her strength was increasing steadily.

CASE 4.—H. M., a white woman aged 39, noted the sudden onset in January 1936 of diplopia, difficulty in swallowing with regurgitation of liquids, and a nasal speech. There was never any subjective or objective evidence of weakness of the extremities. In September 1936 treatment with a prostigmine preparation was begun with decided improvement. A spontaneous remission occurred in July 1937 and continued until December 1938, at which time, following a severe infection of the upper respiratory tract, a return of her former symptoms occurred. From then on she required 15 mg. of prostigmine bromide six to eight times a day combined with 25 mg. of ephedrine twice a day. On this regimen she did well, but her constantly recurring infections of the upper respiratory tract produced periodic exacerbation of her symptoms which could not be controlled adequately with prostigmine. On admission Aug. 16, 1941 she was found to have typical myasthenic weakness of the muscles innervated by the cranial nerves, and, although there was no demonstrable weakness in the extremities, she did have slight dyspnea at rest. She complained of difficulty in breathing unless the head of the bed was elevated. Intra-arterial prostigmine methylsulfate produced moderate weakness in the injected area but improvement of the myasthenic symptoms elsewhere; and it produced five to six fasciculations a minute in the injected hand. The patient had a respiratory infection three weeks prior to her admission to the hospital, and codeine was required in order to control the cough at the time of her admission. Postponement of the operation was discussed but the patient said that she would probably not be free of a cold until the following spring.

Her thymus (right lobe: 9 by 3 by 0.8 cm.; left lobe: 15.2 by 2 by 0.5 cm.) was extirpated on August 21. The operation proceeded without untoward incident except that the intra-tracheal tube could not be introduced. This is the only patient who was not given intratracheal anesthesia. After the patient awakened, she refused to remain in the head depressed position. On the day following the operation she became restless, and rather large doses of morphine (16 mg. in four hour period) were required. The abdominal wall moved inward with inspiration. Bronchoscopic aspiration was considered but the patient died thirty-six hours after the operation before it was undertaken. Autopsy revealed atelectasis of the right and left lower lobes; the bronchi being filled with secretions. No remains of thymic tissue were found. In retrospect, several mistakes were made. The operation should have been postponed. The head-down position should have been insisted on, and the doses of morphine were too large. Bronchoscopic aspiration should have been performed when severe respiratory difficulty developed.

CASE 5.—R. S., a white housewife aged 30, first noted after the delivery of her second child in January 1941 the moderately rapid onset of generalized weakness. In April there appeared increasing bilateral ptosis and diplopia. In May there was rapidly progressive weakness of the extremities, and in June

she first experienced difficulty in swallowing, associated with the development of nasal speech. During the months following her delivery she was amenorrheic and gained 35 pounds (15.9 Kg.). A search for the basis of this gain in weight has been unsuccessful and in the past month her menses have reappeared. She was studied here in July 1941 and found to have the typical myasthenic reaction to the intra-arterial injection of prostigmine methylsulfate and was discharged receiving prostigmine bromide 15 mg. three times a day and ephedrine three times a day, with only partial control of her myasthenic symptoms. Her thymus (right lobe: 8 by 2.5 by 0.8 cm.; left lobe: 8 by 2.5 by 0.8 cm.; left upper pole: 9 by 1 by 0.8 cm.) was removed on August 25. Her postoperative course was smooth. On September 15 the injection of prostigmine methylsulfate into the brachial artery produced moderate increased strength and in addition a few but definite fasciculations. Her requirement for prostigmine bromide, which had been 120 mg. a day pre-operatively, had fallen to 60 mg. a day by September 18, and with this reduced dosage her diplopia and ptosis occurred only after prolonged reading; she had no difficulty with swallowing and she was able to walk about the ward without the fatigue which had been present before operation. Extraocular movements which were quite weak preoperatively are definitely improved. On September 24 the prostigmine bromide dosage was 52.5 mg. a day and a slow return of strength continues.



The left lobe of the thymus of patient 3. The right lobe was slightly smaller.

CASE 6.—M. W., a white housewife aged 34, experienced in July 1939 a relatively rapid onset of generalized weakness especially of the extremities, ptosis, diplopia, difficulty in speech and chewing and slight exertional dyspnea. She was treated in February 1940 with a prostigmine salt with definite improvement, and while receiving prostigmine bromide 15 mg. four times a day was able to be up and about despite moderate fluctuations in her strength. In June 1940 she was placed on a regimen of prostigmine bromide 15 mg. six times a day and ephedrine 25 mg. three times a day. She did well until the spring of 1941, when increasing weakness forced her to take prostigmine bromide 15 mg. every two hours both day and night. Despite this dosage she was unable to walk by herself and experienced difficulty in catching her breath even at rest. In August 1941, the injection of prostigmine methylsulfate into the brachial artery produced local return of power but no fasciculations. The thymus was removed on August 30. There were two lobes, each of which measured approximately 12 by 2.5 by 8 cm. A small opening was made in the left parietal pleura during the operation. On September 13 the intra-arterial injection of prostigmine methylsulfate produced a questionable degree of weakness in the injected arm and rare fasciculations. The postoperative course was distinguished by the fluctuations in the degree of strength and the prostigmine bromide requirement varied between 90 and 130 mg. a day. During the third week in September there was some slight improvement, but it is not pronounced as yet.

THE OPERATION

Thymectomy is a tedious but not a particularly difficult procedure. The main points in need of emphasis are that the thymus is situated almost exclusively in the thorax rather than in the neck and that it is impossible to remove it with any degree of certainty without exposing the anterior mediastinum through an adequate incision.

General anesthesia was produced by an induction with nitrous oxide and oxygen and the subsequent use of oxygen-ether. An intratracheal tube was inserted in all instances except 1. If care is used, one is not likely to make an opening in the pleura, but the tube allows one to aspirate frequently and thus to maintain the airways free of secretions and open. The respiratory movements during the operation are almost solely diaphragmatic or abdominal.

The incision is a longitudinal one, extending from just below the cricoid cartilage, down the midline of the sternum to the fourth costal cartilages. The sternohyoid muscles are separated in the midline. An index finger is then inserted under the manubrium of the sternum, maintaining close contact with the bone, and the right and left layers of pleura are pushed laterally. A Shumacher sternal divider is then used and the upper part of the sternum is divided in the midline. The divided edges of the sternum are then separated by the use of bone hooks. This plan of pushing the pleura away from the sternum with the index finger and of dividing this part is repeated until the level of the fourth costal cartilages is reached. The sternum is then divided transversely at the level of the third interspaces. The divided edges of the sternum are then separated by the use of self-retaining retractors, thus affording an excellent exposure of the anterior mediastinum.

The thymus is usually not visible until after the muscle tissue and fascia at the origins of the sternohyoid and sternothyroid have been divided and the two reflections of pleura have been separated in the midline. The layer of fascia is rather dense, particularly above the level of the left innominate vein, and it must be divided if the thymus is to be seen clearly. The greater part of the thymus lies below the level of the left innominate vein, and in most instances the tissue extends to the level of the fifth costal cartilages. There are usually two lateral lobes which are in close contact along the middle line, and they may be united. They usually extend rather far laterally beneath the pleura. The thymus is attached by tissue which is not very dense to the ascending aorta and the pericardium. There are a number of thymic arteries and veins, most of which appear to be branches of the thyroid or internal mammary vessels. In most instances, the two lobes of the thymus extend up to the inferior poles of the thyroid gland. The thymus is removed by sharp and blunt dissection, care being taken not to injure the pleura. The vessels are doubly ligated and divided. The most likely mistake is that one lobe of the thymus may escape detection. This may have occurred in case 1, but the progress of the patient does not support this possibility.

After the removal of both lobes of the thymus, the incision is closed without drainage. The divided edges of the sternum are approximated with two encircling sutures of braided silk. The soft tissues are approximated with several rows of interrupted sutures of silk.

A more detailed description of the operation together with illustrations will be published at a later date.

THE THYMUS

The operation revealed the presence of definite persistent thymic tissue in all patients. No gross tumors were visible. Thymic tissue was as easily differentiated from the surrounding structures as is the thyroid.

Most of the tissue which was removed was frozen immediately after the operation in order that it might be preserved for future studies. Multiple sections were made through the glands with a razor at a subsequent time, and no tumors were demonstrated. This was performed by Dr. Arnold Rich and the microscopic examination of the tissues will be reported in detail subsequently. Definite hyperplasia was present in all cases except 1. No adenomas were present. The sections from several of the patients revealed the presence of germinal centers.

PREOPERATIVE AND POSTOPERATIVE TREATMENT

The onset of symptoms of myasthenia gravis is frequently accompanied by an infection of the upper respiratory tract. A similar infection is most frequently the precipitating cause of an exacerbation and often results in death, as the beneficial action of prostigmine preparations under these conditions is greatly reduced. Even the mildest infection is dangerous, and for these reasons the most important point in the preoperative and postoperative care of these patients is the prevention of complications, since even those usually considered trivial may prove disastrous to the patient with myasthenia.

Operation should not be considered if there has been any history of an infection for the preceding ten to twelve weeks. This is not only to lessen the danger of an infection in connection with the surgical procedure but also to allow full recovery from the exacerbation of the disease which almost invariably accompanies such an infection.

The patient should enter the hospital several days before the operation to allow a period of rest with adequate doses of prostigmine. Mask isolation should be instituted during this period to prevent infections of the upper respiratory tract. Cross matching with an available donor should be carried out before the operation and enough sulfathiazole or sulfadiazine should be given to maintain a blood level of 5 to 6 mg. per hundred cubic centimeters.

Thirty minutes before the induction of anesthesia 1.5 to 2.5 mg. of prostigmine methylsulfate, 0.6 mg. of atropine sulfate and 10 mg. of morphine sulfate are given subcutaneously. Induction is effected with nitrous oxide and oxygen. A tube is then inserted into the trachea with great care and as little trauma as possible. Ether and oxygen are administered through a closed system. One of the most interesting observations has been the very small amount of ether required.

At the end of the operation (usually one and one-half to two hours after induction) 1 to 1.5 mg. of prostigmine methylsulfate and 0.6 mg. of atropine are given subcutaneously. Before the intratracheal tube is removed suction is applied. In order to lessen the chances of aspiration, the head is lowered by elevating the foot of the bed on 12 inch blocks for thirty-six to forty-eight hours after the operation. The patient is turned frequently. Respiratory difficulties may appear suddenly, so that the following apparatus are kept in readiness in the patient's room: a suction apparatus, an oxygen tent, a laryngoscope and a respirator. The patient has a special nurse who is instructed to make frequent observations of pulse and blood pressure and above all the character and frequency of the inspiratory

movements. An inward movement of the abdominal wall with inspiration is an early indication of difficulty. The postoperative complications to be anticipated are mainly respiratory—atelectasis and pneumonia. These patients withstand complications poorly and tire quickly with unusual respiratory effort. If treatment does not result in prompt relief, the immediate use of a respirator should be considered. It may be advisable to accustom the patient to the respirator preoperatively. The respirations even preoperatively may be mainly diaphragmatic.

Mask isolation is continued for six to eight days after the operation and sulfadiazine is administered until there has been no fever for two days. A portable roentgenogram of the chest is taken routinely each of the first two days following the operation. A widening of the mediastinal shadow has been observed in all patients in the early postoperative period.

Nothing is given by mouth until the day following operation. From 2 to 3 liters of physiologic solution of sodium chloride and 5 per cent dextrose are given intravenously in the first twenty-four hours.

The postoperative dosage of prostigmine is based on the amount received preoperatively. Usually 1 to 1.5 mg. of prostigmine methylsulfate subcutaneously is necessary every two hours for the first postoperative day. After this, 30 to 45 mg. of prostigmine bromide is given orally every two to three hours. There is usually an increased need for the drug during the first two days after thymectomy and not until two to three weeks later does the degree of improvement permit reduction well below the preoperative amounts. Prostigmine causes an increase in the bronchial secretion and saliva. In addition, spasm of the bronchial muscles induced by prostigmine may occur unless fairly frequent doses of atropine are given (0.4 to 0.6 mg. every four to eight hours seems to be a sufficient amount). When improvement takes place, symptoms indicating overdosage of prostigmine such as abdominal cramps appear and the dosage should be reduced.

Morphine has seemed best for the relief of pain postoperatively. The effective and toxic dose, however, is much reduced by the synergistic action¹⁴ of the prostigmine salt and the maximum amount given should not exceed 8 mg. every four hours. The usual indication is pain at the site of operation.

Local anesthetics should not be used unless absolutely necessary¹⁵ and then given only with an extra dose of the prostigmine salt. The amount of all anesthetic agents should be kept as small as possible. Most of the patients have required almost no anesthetic during the last hour of the operation, and yet they regained consciousness very slowly after the procedure was completed. This may have been due to the preoperative dose of morphine, whose effect was prolonged by the synergistic action of prostigmine, or to some fundamental alteration in the effect of anesthetic agents on individuals with this disease.

It is well to emphasize again the fact that these patients withstand complications poorly. Aronson¹⁶ reported recently the death of a patient with myasthenia gravis which occurred twenty-four hours after irradiation of the thymic region. Dr. Viets of Boston

informed us of the death of a patient which followed the introduction of a small quantity of air beneath the sternum. The procedure was carried out in an attempt to demonstrate a tumor of the thymus. Sudden and unexpected death is not rare in patients with myasthenia gravis.

SUMMARY

In this preliminary report of the effects of total thymectomy on the course of myasthenia gravis, the early results are encouraging and suggest strongly that the thymus gland is concerned in some manner in the genesis of myasthenia gravis. The observations suggest furthermore that the thymus is a gland with an internal secretion and that it may have a definite function.

ADDENDUM.—One month after this report was completed and submitted for publication, the course of the first three patients continued to be satisfactory. There is a progressive improvement of strength, and no prostigmine or other therapy is required. The improvement of patients 5 and 6 is less striking thus far than was anticipated in view of the previous experiences. It is possible that an abnormality of the thymus alone is not responsible for the disease and that the role of the thymus may vary in importance in different patients. Other factors, if any, which may be involved in the genesis of myasthenia gravis are matters of conjecture. The possibility remains that removal of the thymus simply breaks a chain of abnormal conditions and thus influences the course of the disease. On the other hand, the dramatic improvement of most of the patients indicates that the thymus is concerned directly in the pathogenesis of myasthenia gravis. Retardation in 1 patient may be due to the development of an acute infection of the respiratory tract.

Clinical Notes, Suggestions and New Instruments

FINAL REPORT ON THE IDENTIFICATION OF THE ORGANISM OF THE PREVIOUSLY REPORTED CASE OF SUBACUTE ENDOCARDITIS AND SYSTEMIC MYCOSIS (MONILIA)

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In the report of the first case of subacute endocarditis with systematic moniliasis ever to have been clinically diagnosed and published¹ it was not possible to state the identity of the causative organism, although it was definitely known to be a species of *Candida* (*Monilia*). Since then, however, studies of cultures which had been submitted to the Division of Infectious Diseases of the U. S. Public Health Service have led to the definite identification of the fungus as *Candida* (*Monilia*) *parakrusei*. Because numerous requests have been made for the final results of our studies, it was deemed advisable to publish them at this time.

The following, therefore, is a brief summary of the mycologic studies of the organism, including some of the more pertinent features mentioned in the previous publication. The present report also affords us the opportunity to publish a reproduction of a photomicrograph of a typical smear from a colony of one of the original blood cultures obtained early in the course of the patient's illness. This illustration was inadvertently omitted from the original publication and would have been figure 8.

Growth on culture on Sabouraud's agar yielded budding ovoid bodies about 4 microns in diameter; hyphae were very rare; cornmeal agar yielded budding ovoid cells from 3 to 4 microns in diameter on the surface; hyphae below the agar

14. Bernheim, F., and Bernheim, M. L. C.: Action of Drugs on the Choline Esterase of Brain, *J. Pharmacol. & Exper. Therap.* 57:427 (Aug.) 1936. Slaughter, D., and Gross, E. G.: Some New Aspects of Morphine Action: Effect on Intestines and Blood Pressure; Toxicity Studies, *J. Pharmacol. & Exper. Therap.* 68:96 (Jan.) 1940.
15. Harvey, A. M.: The Actions of Procaine on Neuromuscular Transmission, *Bull. Johns Hopkins Hosp.* 65:223 (Sept.) 1939.
16. Aronson, S. F.: Myasthenia Gravis: A Discussion, with Presentation of a Case Associated with a Thymoma, *Ann. Int. Med.* 15:137 (July) 1941.

1. Joachim, Henry, and Polayes, S. H.: Subacute Endocarditis and Systemic Mycosis (*Monilia*), *J. A. M. A.* 115:205 (July 29) 1940.

surface were delicate, short and branching freely but producing few buds.

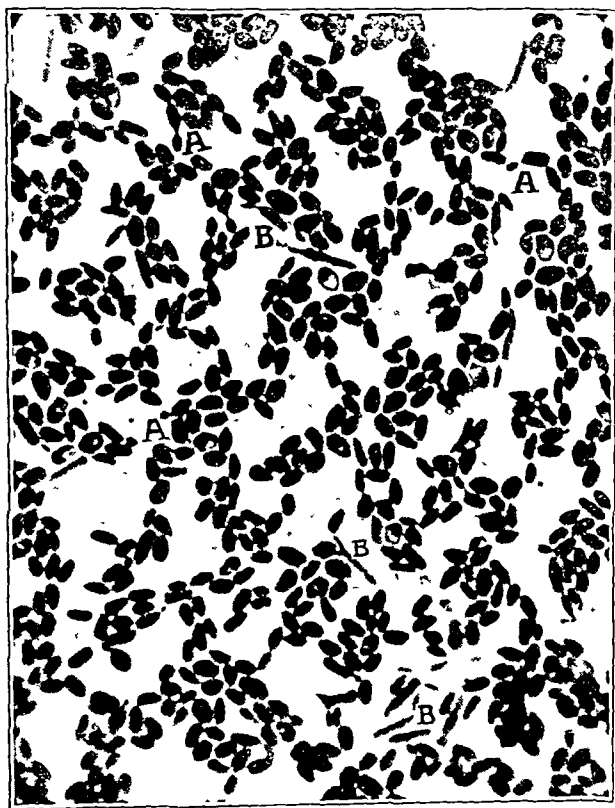
On staining, the yeasts were gram positive except for an occasional pink hypha.

Reproduction was by budding.

Growth characteristics were as follows: In acid dextrose broth after forty-eight hours at 37.5 C. there was growth settling to the bottom and clinging to the side of the tube; the broth was clear except in a few tubes. There was no ring or the ring was barely noticeable at an angle formed by the broth surface and the side of the tube.

On acid dextrose agar after ten days at 30 C. the colonies were ivory to yellow and glistening with margins smooth or slightly scalloped.

On blood agar after ten days at 37.5 C. culture yielded gray, smooth, glistening, nonhemolytic, low dome-shaped colonies with even borders from 2 to 3 mm. in diameter.



Gram stain of a typical smear of one of the colonies of *Monilia* obtained by blood culture. Note (A) budding and (B) elongated forms which suggest the description of atypical mycelia. Reduced from a photomicrograph with a magnification of 1,500 diameters.

Sugar reactions were as follows: There were acid and gas formations in dextrose and levulose broths but not in sucrose, lactose, maltose and raffinose. The amount of gas formation varied, only small bubbles appearing in most tests. (The fermentation reactions are those found on examination of cultures studied by the Division of Infectious Diseases of the U. S. Public Health Service. Studies of previous cultures made in the laboratories of the Cumberland and Bellevue hospitals showed approximately 10 per cent gas formation in maltose, saccharose and dextrose.)

CONCLUSIONS

There are slight discrepancies between the various published descriptions of *C. parakrusei*. Our strain has been somewhat variable in growth characteristics over the period of time it has been studied. The instability of these yeastlike fungi is well known and explains in part the discrepancies in descriptions and the difficulty of identifying some strains. This strain can, however, be definitely identified as *C. (Monilia) parakrusei*. We believe that it is closely related to *Candida krusei*.

North Portland Avenue and Auburn Place.

PARALDEHYDE POISONING

REPORT OF A FATALITY

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Death from paraldehyde poisoning is rare. Kotz¹ reviewed the literature up to 1938 and reported a case of his own in which death ensued following the use of 31 cc. of paraldehyde rectally in a patient with a toxemia of pregnancy.

Since it was introduced about sixty years ago by Cervello² and Strahan,³ paraldehyde has been used extensively as a hypnotic and sedative in a variety of medical conditions and, more recently, has been found to be a useful adjunct in the field of obstetric analgesia.

According to the standard works on pharmacology and toxicology, paraldehyde is considered a safe hypnotic and sedative. Sollmann⁴ states that its actions are similar to alcohol but that its hypnotic effects are more rapid and efficient. "Its acute toxicity is low, so that 100 Gm. produced only very prolonged sleep." He adds that "therapeutic doses do not tend to depress the heart or respiration." Webster⁵ states that "the fatal dose of paraldehyde is difficult to state, as very large quantities have been taken without serious consequences other than prolonged unconsciousness." Gonzales⁶ concurs in this respect, stating that "the fatal dose is uncertain." Leschke⁷ states that recovery has occurred from as much as 150 Gm., and he recorded a case in which death occurred following administration of 52 Gm. of the drug.

An anonymous writer reported a case to the editor of the *Lancet*⁸ in which death occurred after administration of 6 or 7 teaspoons of paraldehyde to a typhoid patient. Hanson⁹ reported a case of poisoning, followed by recovery, which occurred after 120 cc. had been given by mistake to a woman in labor. Brown¹⁰ reported another case after the ingestion of 16 cc. of the drug, but recovery ensued within twenty-four hours. The last case that has been reported is one by Jenkins¹¹ in which poisoning resulted after 24 cc. was given rectally to a woman in labor; after a stormy course there was a complete recovery.

The case reported here is unique in that only 12 cc. of paraldehyde rectally resulted in fatal poisoning. This is the smallest dose of the drug on record to cause death.

CLINICAL SUMMARY

Mrs. J. S., a primipara aged 21, was admitted to the private service of Mount Zion Hospital at 12:05 a. m. on July 3, 1940. Her past history had been singularly free of disease; she stated that she had not had even the usual childhood exanthematous diseases and that she had had no operation or previous hospital entry. She considered herself to have enjoyed excellent health always.

Her last menstrual period was Sept. 22, 1939 and the expected date of confinement was June 29, 1940. The antepartum course had been entirely free of complications. Pelvic measurements were within normal limits. During the ninth month of pregnancy she had noted slight edema of the ankles in the evenings.

Spontaneous rupture of the membranes occurred at 10:30 p. m. on July 2 and she entered the hospital shortly thereafter. At that time, she was not in labor. She was well developed and well nourished. Her weight was 196 pounds (89 Kg.), the temperature 37 C. (98.6 F.), pulse rate 80 and respiratory rate 18 a minute. The heart was normal in size; the sounds were regular and of good quality. There were no murmurs.

From the Obstetrical Service, Mount Zion Hospital.

1. Kotz, Jacob; Roth, G. B., and Ryon, W. A.: *Idiosyncrasy to Paraldehyde*, J. A. M. A. 110: 2145 (June 25) 1938.
2. Cervello, V.: *Arch. ital. de biol.* 6: 113, 1884.
3. Strahan, S. A. K.: *Lancet* 1: 201 (Jan. 31) 1885.
4. Sollmann, Torald: *A Manual of Pharmacology*, ed. 5, Philadelphia, W. B. Saunders Company, 1936, p. 731.
5. Webster, R. W.: *Legal Medicine and Toxicology*, Philadelphia, W. B. Saunders Company, 1930, p. 751.
6. Gonzales, T. A., and others: *Legal Medicine and Toxicology*, New York, D. Appleton-Century Company, Inc., 1937, p. 532.
7. Leschke, Erich: *Clinical Toxicology*, translated by C. P. Stewart, Baltimore, William Wood & Company, 1934, p. 185.
8. *Lancet* 2: 243, 1890.
9. Hanson, Samuel: *California & West. Med.* 47: 191 (Sept.) 1937.
10. Brown, Gilbert: *Brit. J. Anesth.* 13: 25 (Oct.) 1935.
11. Jenkins, J. L., and Herrod, J.: *Bull. John Sealy Hosp. & Univ. Texas School of Med.* 1: 27 (Feb.) 1939.

The lungs were free of abnormalities by percussion and auscultation. The blood pressure was 130 systolic and 90 diastolic. Examination revealed that the baby was in the right occipitoposterior position, that the head was floating and that there was no cervical dilatation. Urinalysis revealed albuminuria (+ degree), and from 8 to 10 red blood cells per high dry field microscopically. The hemoglobin was 9.2 Gm. per hundred cubic centimeters of blood; red blood cells numbered 3,480,000 and the white blood cells 7,350 with a normal distribution.

After a soapsuds enema contractions of moderate severity commenced at 12:30 a. m. on July 3. These continued rhythmically and the cervix slowly dilated. Because the patient was a Christian scientist she refused sedation, but on July 4 she acquiesced and, accordingly, at 9:30 a. m. 12 cc. of paraldehyde in 6 cc. of benzyl alcohol and 30 cc. of physiologic solution of sodium chloride were administered rectally. This she retained. At this time, the cervix was completely dilated, but the head remained in the right occipitoposterior position above the spines. Analgesia was excellent. The patient slept between contractions and became somewhat restless when they occurred. She was taken to the delivery room at 1 p. m. At that time, the anesthetist observed the pulse to be 148 a minute and irregular. The respirations were 48 a minute, deep and labored; the nail beds and ears were cyanotic. She did not seem to respond to the ordinary physical stimuli.

Low forceps (Tucker-MacLean) were applied under light ether anesthesia and a living baby girl weighing 9 pounds, 7 ounces (4,280 Gm.) was delivered from the right occipitoposterior position. A second degree midline episiotomy was performed and repaired. A proprietary uterine stimulant $\frac{1}{320}$ grain (0.2 mg.) was administered intravenously. She was returned to her room at 2:30, still stuporous, with the pulse regular at 130; respirations remained rapid.

In order to rule out the possibility of diabetic coma, urinalysis was repeated. This showed strong reduction with Benedict's solution and a strongly positive acetone reaction, with a trace of diacetic acid. The blood sugar was 72 mg. per hundred cubic centimeters. One cc. of metrazol was administered intravenously and the patient was placed in an oxygen tent.

At midnight, the pulse was 144 and regular, the blood pressure was 96 systolic and 56 diastolic, and the respirations were 36, deep and stertorous. She responded slightly to painful stimuli and occasionally attempted to open her eyes, but otherwise she remained comatose. The pupils reacted to light. The deep tendon reflexes were absent, but there were no abnormal reflexes. A total of 20 cc. of nikethamide was given intravenously in divided doses over a period of five and one-half hours, without benefit. An intravenous infusion of dextrose was started. Despite these supportive measures pulmonary edema gradually ensued, and at 5:30 a. m. on July 5 a generalized convulsion occurred. Carpopedal spasm and a positive Chvostek sign were elicited. The patient died at 7 o'clock, some eighteen hours after delivery and about twenty-one and one-half hours after administration of the paraldehyde.

The baby on admission to the nursery weighed 9 pounds 7 ounces. She was cold to the touch and her breathing was shallow. She had repeated bouts of cyanosis followed by convulsions, and despite inhalations of carbon dioxide and oxygen she died thirty-one hours after delivery.

An autopsy on the body of the mother, which was performed by the coroner's office of San Francisco twelve hours after death, revealed the following conditions: "Acute pulmonary congestion and edema, subpleural and subpericardial hemorrhages consistent with asphyxia, pericarditis and adrenal apoplexy. Negative for poisons."¹² The toxicologist reported only traces of paraldehyde in the blood, urine and gastric contents. An autopsy was not done on the body of the baby.

COMMENT

Poisoning by paraldehyde is considered to be a drug idiosyncrasy. The most prominent clinical feature is the profound coma. The postmortem changes are not characteristic.¹³

Bodansky and his associates¹⁴ in their recent studies on the pharmacology and toxicology of paraldehyde reported data which suggest that damage to the liver might play an important role in paraldehyde poisoning.

Doubtless in the case reported here, the element of individual idiosyncrasy to paraldehyde was the deciding factor that caused death. Isolated instances of this sort should not militate against its continued use in medicine and obstetrics, although cognizance should be taken of the possibility of poisoning.

550 Lake Street.

PLEXIFORM NEUROFIBROMA (VON RECKLINGHAUSEN'S DISEASE) INVADING THE ORAL CAVITY

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NEW YORK

Our purpose in this report is to record 2 cases of bulky plexiform neurofibroma involving the oral cavity and occurring as part of generalized neurofibromatous (von Recklinghausen's) disease. The neurofibromatous tumors which constitute the main characteristic of this disease occur most often in the subcutaneous tissues, and we have been unable to find any report in the literature of bulky intraoral involvement. Small



Fig. 1 (case 1).—Section of excised specimen showing plexiform neurofibroma.

isolated fibromas, probably representing the end stage in the organization of pyogenic granulomas, are common in the oral cavity, especially in the mucosa of the cheeks and the tip of the tongue, and should not be confused with these bulky lesions which have a different causation.

Of the 2 cases reported here, the intraoral growth in 1 has remained benign and is only slowly increasing in size. In the other case, the neurofibromatous invasion of the pharyngeal wall and the tongue was associated with a neurogenic sarcoma of the lateral aspect of the neck, and the patient died of local extension of this malignant tumor.

GENERAL CONSIDERATIONS OF VON RECKLINGHAUSEN'S DISEASE

Generalized neurofibromatosis was first described by von Recklinghausen¹ in 1882. He called attention to four major and highly characteristic symptoms and showed that at least three of these have a common pathogenic background: (1) soft cutaneous tumors (formerly called fibroma molluscum); (2) fusiform swelling (neurofibromas) of the nerves; (3) plexiform tumors made up of a network of criss-crossing, anastomosing nerve fibers, and (4) coffee colored areas of pigmentation in the skin (café-au-lait spots).

¹⁴ Bodansky, Meyer; Jinks, J. L.; Levine, Harry, and Gilbert, A. J. *Anesthesiology* 2: 20 (Jan.) 1941.

¹ von Recklinghausen, Friedrich. *Ueber die multiplen Fibrome der Haut und ihre Beziehung zu den multiplen Neuomen*, Iestschrift, Berlin, 1882.

¹² Autopsy report of the coroner of the City and County of San Francisco.

¹³ McNally, W. D.: *Toxicology*, Chicago, Industrial Medicine, 1937, p. 671.

Actually, this syndrome had been known long before von Recklinghausen wrote his now famous monograph, but it was his work which first pointed out the derivation of the superficial tumors from the terminal nerve filaments. If, as is now believed by many, the café-au-lait spots are of neurogenic origin, then all four cardinal symptoms can be reduced to a growth perversion of the fetal neuro-ectoderm. The condition known as elephantiasis neuromatosa is closely related.

In addition to the syndrome outlined, there are several less obvious manifestations of von Recklinghausen's disease. The condition often exhibits a familial tendency. The patients usually deteriorate mentally as well as physically. They may show various kinds of localized hypertrophies, body asymmetries, developmental defects, endocrine dyscrasias, bony abnormalities, neurotrophic tumors and a variety of bizarre and ill understood phenomena.

The neurofibromas of this disease may occur in the course of nerves anywhere in the body. The most common sites are the subcutaneous tissues of the upper inner surface of the thigh, the inner surface of the upper arm and the posterior surface of the forearm. These lesions are also sometimes found under the mu-

he was 4 months old his parents had noticed a prominence of the right side of the jaw which slowly progressed. There was no family history of von Recklinghausen's disease.

Physical Examination.—The general physical and mental development seemed about normal for the patient's age. There were numerous flat, pigmented spots scattered irregularly over the body. The right side of the face presented a diffuse swelling of the soft tissues overlying the mandible from the lobule of the ear to the symphysis menti and extending down into the submaxillary region. This swelling was soft superficially, but at a depth of 2 to 3 cm. there was a nodular, cordlike, more indurated portion. The right lower gum and the floor of the mouth bulged upward and, when palpated, revealed a diffuse submucous indurated swelling. The mucous membrane of the gum was closely attached to the lesion but was movable over the tumor in the floor of the mouth. The tongue was normal. Roentgenograms of the mandible revealed no alteration in bone contour or structure. The blood count was normal and urinalysis and roentgenograms of the chest were negative.

Treatment and Clinical Course.—The oral lesion was recognized as a manifestation of neurofibromatosis and, since there appeared to be no interference with comfort or function, no active treatment was advised at first. During the following two years the local swelling over the mandible and within the mouth increased and became more nodular. The gums on the affected side participated in the general hypertrophy, and the teeth became pushed apart because of a unilateral increase in the size of the mandible. The process within the mouth remained confined to the right side of the midline. In 1934, following the steady increase in size of the local tumor, an attempt was made to excise the submaxillary tumor through an external incision. At the time of operation it was noted that the superficial nerves were numerous and thickened.

The tumor consisted of edematous, soft, lobulated, grayish white tissue which had completely replaced the submaxillary and the sublingual glands. This tissue had also infiltrated the floor of the mouth so widely that its complete removal was impossible. The excised specimen measured 6 by 2 by 2.5 cm. The microscopic diagnosis was plexiform neurofibroma (fig. 1).

Systematic roentgen examinations of the mandible have revealed progressive bone changes. In May 1937 the inferior border of the mandible appeared to be thickened, suggesting osteoma, and in November 1939 roentgenograms showed steady progression of the osteomatous changes and also the appearance

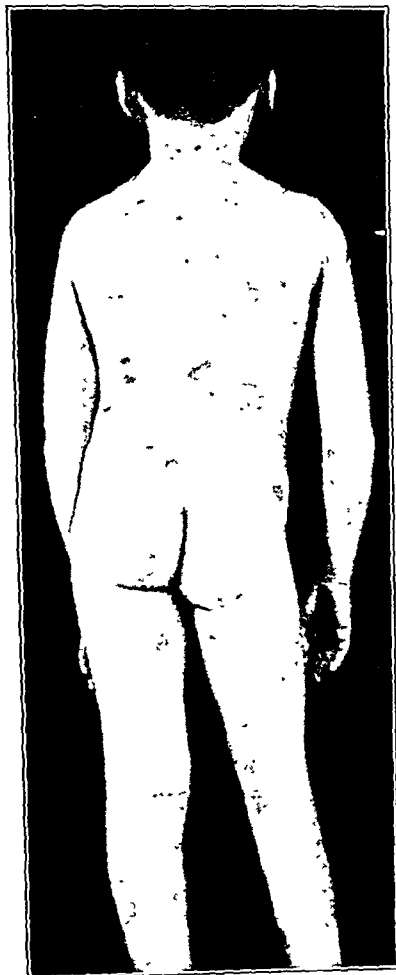


Fig. 2 (case 1).—Numerous café-au-lait spots are seen on the skin of the back, upper extremities and thighs. Moderate scoliosis of the spine is also shown.

cous membranes of the mouth, the esophagus, the stomach or other parts of the gastrointestinal tract.

INTRAORAL MANIFESTATIONS OF NEUROFIBROMATOSIS

From a review of the literature, it would appear that the mouth is rarely involved in cases of generalized neurofibromatosis. For instance, Bruns² in a collected series of 58 cases found only 2 with oral lesions, neither of which was bulky. It is possible that small neurofibromas occur in the mucous membrane of the gastrointestinal tract more frequently than is generally supposed since, when small and asymmetrical, they would escape notice even in the oral cavity unless specifically searched for. As has been previously mentioned, small isolated neurofibromas of the mucous membrane are common benign lesions and are frequently seen in a cancer clinic, where they constitute one of the minor problems in the differential diagnosis of cancer.

The following reports of cases describe bulky involvement of the oral cavity by plexiform neurofibromas in association with generalized neurofibromatosis.

REPORT OF CASES

CASE 1.—History.—E. P., a white boy aged 3 years, was first seen in the clinic at the Memorial Hospital in 1932. When

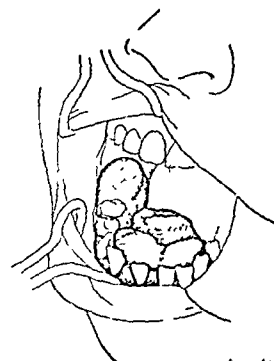


Fig 3 (case 1).—The lower gum, especially on the right and anteriorly, is considerably thickened, and some of the teeth have been forced outward and apart by expansion of the growth. A separate mass protrudes from the floor of the mouth.

of a cystic area in the posterior portion of the horizontal ramus which has slowly advanced, as revealed by later examinations.

Within the past two years slowly progressing scoliosis has developed, as shown in figure 2. Although there has been a definite, though slow, growth of the tumor of the jaw, its increase in size has not been greatly out of proportion to the

2. Bruns, Paul: Ueber das Renkenneurom, Beitr. z. Klin. Chir. S: 1, 1891.

boy's general development. At the present writing the appearance is as indicated in figures 3 and 4. There is as yet no evidence of mental deterioration.

CASE 2.—*History*.—D. M., a white girl aged 5 years, was first seen at the Memorial Hospital in October 1939. The



Fig. 4 (case 1).—Diffuse enlargement of the lower right side of the face.

patient's mother, several of the maternal aunts, the maternal grandmother and the great-grandmother were said to have had numerous brown spots on the skin, but as far as could be learned none had had subcutaneous tumors of von Recklinghausen's disease. At the age of 10 months an enlargement was noted on the left side of the child's face. She was taken to a hospital where several roentgen treatments were given, despite which the swelling steadily increased and spread to involve the left side of the neck, the floor of the mouth and the tongue. In the spring of 1939 there was a sudden sharp increase in the size of the external tumor on the side of the neck, and in July 1939 she was operated on at the Presbyterian Hospital in New York. At this operation a well defined bulky tumor mass was found deeply invading the subcutaneous tissue and deep fascial planes, extending from the jugular fossa downward in the left side of the neck. Owing to its deep and widespread infiltration it could not be completely removed. The microscopic diagnosis was "plexiform neurofibroma with areas of sarcomatous degeneration" (fig. 5). The wound healed by primary union, but in two months there was evidence of a recurrence.³ At this time the child was brought to the Memorial Hospital.

Physical Examination.—The general physical and mental development of the patient appeared to be normal for her age. There were numerous café-au-lait spots scattered over the body. The left side of the face and neck presented a large globular mass 11 cm. in diameter centered about at the angle of the mandible (fig. 6). On examination of the oral cavity, the external mass was found to be continuous with a diffuse submucous involvement of the soft tissues of the cheek, the gums and the left half of the tongue from the tip back to the base and extending into the tonsillar region. The left half of the mandible appeared to be hypertrophied, and the teeth on that side were widely spaced and poorly aligned. The lesion did not cross the midline. The soft tissues of the mouth and the subcutaneous tissues of the neck and cheeks were of a rubbery consistency, moderately firm and slightly nodular.

3. Dr. C. D. Haagenen supplied this part of the history.

Although the skin was movable over the tumor, the mucous membrane seemed rather firmly attached to the lesion within the mouth, but there was no sign of ulceration. There was a recent operative scar 10 cm. long over the upper anterior border of the sternomastoid muscle. The left seventh nerve was partly paralyzed. Routine laboratory tests gave essentially negative results. Roentgen examination of the mandible showed little alteration in contour of the bone except for some pressure atrophy in the region of the coronoid process with subluxation of the temporomandibular joint. Roentgen examination of the lungs showed some elevation of the left side of the diaphragm, presumably from damage to the phrenic nerve in the neck at the time of the attempted operative removal. The skull showed a mild increase in the convolutional markings in the occipital region. The rest of the skeleton was normal.

Treatment and Clinical Course.—The clinical appearance at this time and a review of the histologic slide from the former operation indicated that the resumption of rapid growth under the operative scar was due to a malignant tumor, a neurogenic sarcoma, and that the lesion within the mouth and on the outer surface of the mandible was benign plexiform neurofibroma. Since the recurrent postoperative tumor was inoperable, it was believed that radiation therapy was the only justifiable method of treatment. Over a period of six weeks the patient received fifteen doses of 200 roentgens each to the recurrent tumor in the left side of the neck. The other physical factors were 220 kilovolts, 1.5 mm. of copper filter, 50 cm. target-skin distance, skin portals 9 cm. circular. This treatment was supplemented by the implantation of radon seeds on two occasions for a total dose of 22 millicuries. Although the dose of radiation was great enough to produce a blistering reaction of the skin, it seemed to have little effect on the tumor, which grew steadily, finally producing a bulky necrotic mass shown in figures 7 and 8. The patient died of cachexia and terminal pneumonia approximately one year after the operation and eight months after the beginning of radiation therapy.

Necropsy.—The local tumor invading the soft tissues at the side of the neck extended from about the mastoid region well

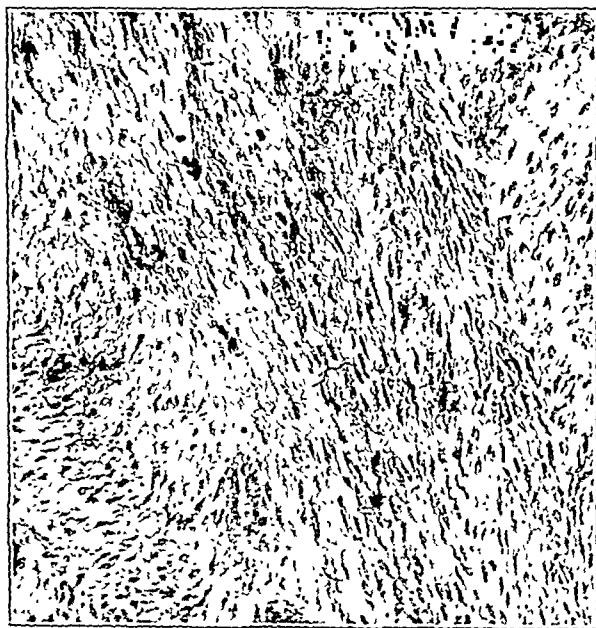


Fig. 5 (case 2).—Section of excised specimen showing plexiform neurofibroma with areas of sarcomatous degeneration.

down into the supraclavicular area. It had invaded and destroyed the mastoid bone, the angle of the mandible, the sternomastoid muscle and the carotid sheath. All the soft tissues in the floor of the mouth were replaced by tumor. The tongue was a shapeless mass completely filling the mouth. The entire tumor measured 25 by 20 by 8 cm. and weighed 2 Kg. Grossly the tumor consisted of glistening white fibrous tissue which

contained huge numbers of curled up and twisted nerve trunks of all sizes. These trunks after being teased out were not cylindric but rather bulbous, moniliform, beaded and nodular.

There was no evidence of regional or distant metastases. The only other positive finding, beside the extreme emaciation,



Fig. 6 (case 2)—The tumor in the early stages, showing the extensive bulging of the left cheek. The jaws could not be separated widely enough to obtain a photograph of the invasion of the tongue by neurofibromatosis.

was a greatly enlarged liver which reached into the pelvis and weighed 900 Gm. Microscopically the bulk of the liver was due to fatty and degenerative changes without any evidence of tumor invasion.

Microscopically the tumor tissue showed branching and fusing streamers and bundles of oval nuclei on a typically neuromatous



Fig. 7 (case 2)—Anteroposterior view in the terminal stages of the disease, showing the bulky necrotic neurogenic sarcoma.

pattern. In some areas nerve fibers could be identified, but for the most part they had been replaced by tumor tissue. Edema, myxomatous degeneration and liquefaction were widespread. The malignant propensities of the growth were indi-

cated by areas of great cellularity with deep staining nuclei. There were no necrotic areas. The microscopic diagnosis was "pleomorphic neurogenic sarcoma of medium grade."

COMMENT

Both of these patients had unmistakable generalized neurofibromatosis (von Recklinghausen's disease) in addition to their cervical and intraoral tumors. In case 1 there were café-au-lait spots and scoliosis. In this case the symptoms from the intraoral tumor are as yet little more than cosmetic and orthodontic, but it may be expected that the patient will eventually have further complications, either locally from tumor extension or generally from the other effects of this disease. The facial deformity is due as much to a disturbed growth of the parts as to plexiform neurofibromatosis. Since the growth disturbance persists in such cases even though the tumor is removed, the results of operative treatment are always disappointing. The patient is being kept under regular interval observation.

In case 2, the disease ran an entirely different and unique course. The patient had a family background which is generally believed to predispose to early complications. It has been



Fig. 8 (case 2)—Lateral view in the terminal stages of the disease.

observed that when the disease runs through several generations it often has a tendency with each reappearance to occur at an earlier age and to become more severe. As far as we know, an instance of such a fulminating course before the age of puberty has never been reported previously. The tendency toward malignant degeneration in von Recklinghausen's disease is generally recognized. Garré⁴ in 1892 reported the incidence as 1.2 per cent. Hoffman⁵ in 1910 arrived at the same figure and Hosoi⁶ in 1931 reviewed the literature and found it to be 13 per cent. The youngest patient in Hosoi's series was 15 years.

The neurogenic sarcoma in case 2 illustrates several common characteristics of this type of tumor, namely its radioresistance, its failure to metastasize and its locally destructive and invasive characteristics. Stewart and Copeland⁷ in an analysis of the clinical material at the Memorial Hospital found that only a small percentage of neurogenic sarcomas are radiosensitive.

4. Garré, Carl. Ueber sekundär maligne Neurome, Beitr. z. klin. Chir. 9: 465, 1892.

5. Hoffman, J.: L'étude des théories actuelles sur la neurofibromatose et ses complications, Thèse de Genève, 1910.

6. Hosoi, Kiyoshi. Multiple Neurofibromatosis, with Special Reference to Malignant Transformation, Arch. Surg. 22: 258 (Feb.) 1931.

7. Stewart, F. W., and Copeland, M. M.: Neurogenic Sarcoma, Arch. J. Cancer 15: 1235 (July) 1931.

In Hosoi's series there were metastases in only 22 per cent of the cases. The rapid growth and destructiveness of the tumor in our case 2 is characteristic of all malignant tumors in childhood as compared to their anatomic and histologic counterparts in the adult.

Plexiform neurofibromas, although histologically benign, are always infiltrating and invasive tumors which cross tissue planes and anatomic boundaries, a fact which is well illustrated in both cases recorded in this report. Despite this invasive capacity it is noteworthy that in neither instance did the lesion cross the midline. This peculiarity is well illustrated by case 1, in which the invasion of the mandible, the gum, the floor of the mouth and the tongue has not passed the midline. In case 2 the lesion remained unilateral until the tumor assumed a rapidly growing invasive quality during the last few months of life. Müller⁸ has collected 4 cases of "macroglossia neuromatosa unilateralis" and added 1 of his own.

SUMMARY

In the 2 cases of generalized neurofibromatosis here reported there was bulky invasion of the oral cavity. Both of these occurred in children with involvement of the subcutaneous tissues, the bone and the soft tissues of the gum, the floor of the mouth and one side of the tongue. In 1 case the disease appears to be only slowly progressing and benign. In the second case the local tumor took on malignant, locally invasive characteristics and caused death. The autopsy revealed no sign of general dissemination.

737 Park Avenue.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

THEODORE G. KLUMPP, M.D., Secretary.

ALUMINUM HYDROXIDE GEL.—An aqueous suspension containing not less than 3 per cent nor more than 4.2 per cent of aluminum oxide, chiefly in the form of aluminum hydroxide. Flavoring, sweetening and preservatives may be added.

Actions and Uses.—Aluminum hydroxide gel has been shown to be an effective gastric antacid and neutralizes hydrochloric acid of the stomach by chemical reaction. It does not increase the pH of the gastric juice beyond the point which interferes with peptic digestion, does not stimulate a compensatory increase in free gastric acidity and does not produce systemic alkalization, which are the principal disadvantages of ordinary alkalis. The amphoteric nature of aluminum hydroxide gel is not of clinical significance because it reacts as an acid only in fluids with a pH above 9: such a pH is not encountered in the gastrointestinal tract. Its so-called buffer action occurs only at a pH of about 4. It is presumed that the acid salt aluminum chloride, which is formed by the reaction of aluminum hydroxide with hydrochloric acid in the stomach, is reconverted to the original compound or other aluminum compounds by reaction with the less acid contents of the small intestine, and the chloride is reabsorbed. Its mild astringent and demulcent properties are believed to be of some importance in the local effect on peptic ulcer. Some evidence also suggests that its effectiveness may be further explained by the tendency to increase mucin secretion and the ability to precipitate pepsin *in vitro*. See also the general article, Aluminum Compounds, New and Nonofficial Remedies, 1941, page 53.

As with other aluminum compounds, aluminum hydroxide is not absorbed from the gastrointestinal tract to any appreciable extent and is therefore nontoxic when administered orally. Its astringent property may produce a constipating effect.

There is evidence available to suggest that administration of aluminum compounds may interfere with the absorption

of certain minerals and can produce a phosphorus deficiency in the presence of a relative or absolute pancreatic deficiency, diarrhea or low phosphorus diet by combination with phosphates in the intestinal tract. This objection does not affect its usefulness in uncomplicated peptic ulcer and gastric hyperacidity, since the diet employed in these conditions is ordinarily relatively rich in phosphorus. Aluminum hydroxide gel may possess adsorptive properties, but specific conclusive evidence that acid, toxins, bacteria or gases are absorbed is lacking, and in the case of hydrochloric acid is opposed by *in vitro* evidence to demonstrate that its reaction with this substance is completely accounted for on the basis of simple chemical neutralization.

Aluminum hydroxide gel is recognized for oral use as an adjunct in the treatment of peptic ulcer (gastric and duodenal) to promote healing, relieve pain and control hemorrhage in this condition and for the control of symptomatic gastric hyperacidity only. Its oral or rectal use in the treatment of other gastrointestinal conditions is not adequately supported by existing clinical evidence.

Dosage.—Aluminum hydroxide gel is administered orally in doses of from 1 to 2 drachms (4 to 8 cc.) in one-half glass of water or milk every two or four hours, or one-half to one hour after meals. It may be administered by the method of continuous drip by stomach tube in dilutions of 1 part to 2 or 3 parts of water (25 to 33½ per cent aluminum hydroxide gel) at the rate of 15 to 20 drops a minute for a total of approximately 1,500 cc. of diluted suspension per twenty-four hours.

Creamalin.—A brand of aluminum hydroxide gel—N. N. R. The preparation contains 5.5 per cent aluminum hydroxide (equivalent to 3.3 per cent aluminum oxide). Oil of peppermint is added as a flavoring agent. Marketed in bottles of 3, 6 and 12 fluidounces.

Manufactured by Alba Pharmaceutical Co., Inc., New York. No U. S. patent. U. S. trademark 353,596 (registered Feb. 15, 1938).

Aluminum hydroxide gel occurs as a white or light gray suspension which may settle out to some extent or form a semisolid on standing but which liquefies on shaking. The specific gravity at 25 C. is from 1.030 to 1.042.

Transfer about 5 Gm. of aluminum hydroxide gel to a glass container and add 10 cc. of diluted hydrochloric acid: the solution is clear and colorless within ten minutes; to this solution add 8 cc. of ammonia water: a flocculent precipitate appears which is insoluble in excess ammonia water but soluble in sodium hydroxide solution. To about 5 Gm. of aluminum hydroxide gel in an Erlenmeyer flask add 10 cc. of sodium hydroxide solution and boil: the fumes do not turn moistened red litmus paper to blue (ammonia).

Dissolve 10 Gm. of aluminum hydroxide gel in 10 cc. of diluted hydrochloric acid and boil. Cool, dilute to 250 cc. and filter if necessary. To 10 cc. add 1 cc. of barium chloride solution and allow to stand for ten minutes: the turbidity is not greater than that produced by 0.2 cc. of fiftieth-normal sulfuric acid in 10 cc. of water.

The pH at 25 C. of aluminum hydroxide gel is between 6.4 and 7.2. Dissolve 2.5 Gm. of the gel in 5 cc. of diluted sulfuric acid and boil: the solution meets the U. S. P. XI test for arsenic. Dissolve 10 Gm. of aluminum hydroxide gel in 10 cc. of diluted sulfuric acid: the resultant solution conforms to the U. S. P. XI test for heavy metals.

Transfer 25 Gm. of aluminum hydroxide gel, accurately weighed, to an Erlenmeyer flask, add 25 cc. of distilled water and 0.2 cc. of potassium chromate solution. Titrate with tenth-normal silver nitrate to a faint pink color: the chloride content is not greater than 0.25 per cent.

Transfer about 3 Gm. of aluminum hydroxide gel, accurately weighed, to an Erlenmeyer flask, dilute to 30 cc. and maintain at 37.5 C. Titrate with tenth-normal hydrochloric acid during forty minutes, adding the acid in 0.5 cc. portions toward the end of the titration, using bromophenol blue as indicator: the volume of tenth-normal acid used is not more than 2,500 cc. nor less than 1,250 cc. per hundred Gm.

Transfer about 3 Gm. of aluminum hydroxide gel, accurately weighed, to a 250 cc. beaker and dilute to 100 cc. Add 10 cc. of diluted hydrochloric acid, heat to boiling and make the mixture alkaline to methyl red with ammonia water. Dilute to 200 cc., heat to boiling and wash four times by decantation. Filter and wash the precipitate free of chlorides with an aqueous solution containing 1 part of ammonia water in 25 parts of solution. Dry the precipitate and ignite at 900 C. to constant weight: the aluminum oxide content is not less than 3 nor more than 4.2 per cent.

THIAMINE HYDROCHLORIDE—U. S. P. (See New and Nonofficial Remedies, 1941, p. 551).

The following dosage form has been accepted:

Solution Thiamine Hydrochloride-Upjohn, 50 mg. per cc., 10 cc. total: Each cubic centimeter contains 50 mg. of thiamine hydrochloride, equivalent to 16,667 U. S. P. units, and 5 mg. of chlorobutanol in sterile distilled water.

Prepared by the Upjohn Company, Kalamazoo, Mich.

RIBOFLAVIN (See New and Nonofficial Remedies, 1941, p. 553).

The following dosage form has been accepted:

Tablets Riboflavin-J. I. C., 1 mg.
Prepared by International Vitamin Corporation, New York.

8. Müller, Hans: Makroglossia neurofibromatosa congenita, Centrallbl. f. allg. Path. u. path. Anat., 57:55 (March 20) 1933.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 1, 1941

ARMY MORALE AND THE MEDICAL RESERVE CORPS

Recently much has been written about morale, an invisible and intangible factor which, like a vitamin, a ferment or a hormone, has vast potentialities. The United States Army in supervising and directing the habits and lives of over a million of our young men of impressionable age is not only building a fighting force but shaping the morale of this nation for years to come.

Various definitions have been used to describe the elusive nature of morale. A playwright in a recent popular play¹ had his hero call it "a dirty French word." The outgoing chief of the Morale Branch of the Army² preferred the definition "a state of mind with reference to confidence, courage, zeal and the like—especially of a number of persons associated in some enterprise, as troops." A philosopher³ with Army World War experience used various terminologies. A psychologist⁴ who was a morale officer in the World War recently emphasized that morale had its basis in physical and economic well-being in addition to mental fitness, while a science writer⁵ set out four attributes of morale, with emphasis on physical well-being. Gulick⁶ called it "the quality of the spirit of the whole," an Army officer⁷ with World

War morale experience depicted it as "a science involving a number of sound principles of psychology applied to the everyday life of the soldier." The chief of the Morale Branch of the Army⁸ in the last World War decided that "morale is a term which should be used to express the measure of determination to succeed in the purpose for which the individual is trained or for which the group exists."

Only recently President Roosevelt affirmed the present importance of morale with the observation "we are only as strong as our morale,"⁹ and experts on morale have been showering our legislators and our press¹⁰ with suggestions that something be done on a national scale to mobilize and direct our national morale, be it civil or military.

Rumors and impressions concerning lack of proper morale in the United States Army have been spread over the pages of newspapers and surveys have been made and published by *Life* and *Time* magazines. The recent appointment of Frederick Osborn, New York financial leader, scientist and humanitarian, to be brigadier general in the Army, in charge of the Morale Branch, has already stimulated interest in improved Army morale. Some veteran newspaper reporters who saw the Nazi army in action in Europe and who recently saw the American Army on maneuvers state that even now the United States Army "has the edge" on the Germans in morale.¹¹

The medical profession has a large concern in the question of Army morale. On the shoulders of 9,950 physicians now in active service¹² as medical officers in the Army rests a large part of the burden of keeping the soldiers mentally and physically healthy. Of this total, 8,700 medical officers have been drawn from the Medical Reserve Corps, while 1,250 are regular Army medical corps officers. The importance of the morale of these medical officers directly and indirectly might well cause the War Department some concern, since the attitude of the reserve medical officers now on active duty has been seriously affected by a policy recently adopted.¹³ This policy provides that promotions above the grade of Major are temporarily suspended as far as reserve officers are concerned. The Medical Reserve has existed for thirty-three years. It was the first reserve corps created in the United States Army.¹⁴ Reserve corps were unknown in any other branch of the Army until 1916.

How can the policy makers in the War Department expect a doctor to have "a state of mind with reference to confidence, courage, zeal and the like" when he

1. Brennan, Frederick Hazlitt, *The Woakey*, 1941.

2. Ulio, Brig. Gen. James A. Building Military Morale, *Hygeia* 19: 792 (Oct.) 1941.

3. Hocking, W. E.: *Morale and Its Enemies*, New Haven, Yale University Press, 1918.

"Morale is the practical virtue of the will to war." p. ix.

"In no war, I judge, has the human quality counted for so much—the endurance, the initiative, the power of sacrifice, the loyalty, the ability to subordinate personal interest and pride, the power of taking the measure of the event, of discounting the unfavorable turn, of responding to frightfulness with redoubled resolution rather than with fear, of appreciating the real emergency and rising constantly to meet it. It is these qualities of mind and character which in the ensemble go by the name of 'morale'; and it is these qualities that hold the balance of power in war." p. 8.

"Morale wins, not by itself, but by turning scales, it has a value like the power of a minority or of a mobile reserve. It adds to one side or the other the last ounce of force which is to its opponent the last straw that breaks its back." p. 9.

"What 'condition' is to the athlete's body, morale is to the mind. Morale is condition. . . ." p. 14.

4. Fryer, D. H., quoted in *Science News Letter* 39: 101 (Feb. 15) 1919.

5. Van de Water, M. *Morale Defense*, *Science News Letter* 39: 330 (May 24) 1941. The author sets out the elements of morale as (1) physical well-being (good health), (2) mental well-being (freedom from worry), (3) confidence in leadership, (4) recognition of the individual.

6. Gulick, L. H.: *Morals and Morale*, New York, Association Press, 1919, p. xi.

7. Miller, A. H.: *Leadership*, New York, G. P. Putnam's Sons, 1920, p. 4.

8. Munson, Brig. Gen. E. L.: *The Management of Men*, New York, Henry Holt & Co., 1921, p. 3.

9. Message to Defense National Recreation Congress, Baltimore, Sept. 29, 1941.

10. Perry, R. P. (professor of philosophy, Harvard University): Letter to New York Times, Sept. 2, 1941. Pope, A. A. (chairman of Committee for National Morale): Letter to New York Times, Sept. 26, 1941.

11. Kay, L., and Hottelet, R. C.: United Press dispatch dated Sept. 30, 1941 from Shreveport, La.

12. War Department figures as of Sept. 27, 1941.

13. Press Release, War Department, dated Aug. 29, 1941.

14. Hume, L. E.: *Training of Medical Officers for War Duty*, *War Medicine* 1: 624 (Sept.) 1941.

spends a number of years in the Medical Reserve Corps, is called from his practice to active duty and finds that it is impossible for him to secure a promotion above the rank of Major, no matter what his service or what his ability? Perhaps the new chief of the Morale Branch of the Army, under his powers to investigate and recommend morale-building factors to the General Staff, will investigate the morale-destroying effect of this newly adopted policy.

None of the reserve officers expect promotion over the heads of regular Army officers, but reserve officers who merit advancement should not be routinely held back. Promotion of reserve officers is now provided for by a ruling of the Adjutant General¹⁵ which sets forth the requirements for obtaining a "Certificate of Capacity" which is necessary before a reserve officer can be promoted to a higher grade. This regulation requires a year of active duty with an efficiency rating of at least "satisfactory" for grades up to and including that of Major, and of "excellent" for grades of Lieutenant Colonel and Colonel. This limitation on promotion is fair and should be the only limitation, provided the reserve officer's age and experience warrant a higher rank.

AIR BORNE INFLUENZA VIRUS

The extent to which infectious agents pass from the respiratory tract of one host to that of another through the air has been frequently investigated. William F. and Mildred W. Wells¹ have emphasized the possible importance of "droplet nuclei," ultramicroscopic particles resulting from the evaporation of expelled spray. Such nuclei are little influenced by gravity and may carry viable bacteria in the air for many hours. Wells and Brown² have demonstrated the prolonged viability of the influenza virus in the air. Now further important experimental evidence along these lines has recently been reported by Andrews and Glover³ of the National Institute for Medical Research in England.

The British investigators exposed normal ferrets in a closed room to ferrets experimentally inoculated with influenza A virus. Each room was about 6 by 6 by 9 feet high and was provided with a window facing the door. Before each experiment the walls, ceiling and floor of each room were washed down with saponated solution of cresol followed by water from a high pressure hose. The attendants wore rubber boots and mackintoshes wet with cresol solution and otherwise adopted meticulous antiseptic precautions. In most experiments two infected "donors" were placed in a single open wire meshed rabbit cage near the floor on one side of the room, while the two normal "recip-

ients" were placed in two separate cages on the opposite side of the room and about 3 feet above the "donors." In certain experiments a plywood screen was placed between the donor and the recipient in order to minimize the possibility of direct droplet transfer.

In their initial experiments 21 normal ferrets were exposed at a horizontal distance of 5 feet to 19 infected donors. After an exposure of from four to seven days 13 of the normal ferrets developed typical fever (104.6 F. or higher) and nasal symptoms, and in all cases the diagnosis was confirmed by a subsequent immunity test with homologous influenza virus. Aerial transmission of infectious doses of the influenza virus is therefore readily effected in closed rooms, the direct projection of nasal spray presumably being of minor importance. In control experiments in which the window was left open so as to increase ventilation, cross infection did not take place despite seven days' exposure to the infected air.

The idea that infectious particles may spread by means other than droplet transfer was further confirmed by successful infection of normal ferrets through S shaped or U shaped ventilation shafts, the cages being so planned that, at the low air speed employed, gross particles presumably would not be carried around the right angle turns but would impinge on the walls and be trapped. In all experiments by this technic 100 per cent takes were recorded after from five to seven days' exposure to the contaminated air currents.

Of equal hygienic interest are Glover's¹ tests of the possible aerial transmission of a double streptococcic influenzal infection. Ferrets simultaneously inoculated with influenza A virus and group C streptococcus usually exhibit fatal respiratory symptoms, necropsy revealing intense hemorrhagic reactions of the nasal mucosa with a plum colored congestion involving nearly the whole of both lungs. Such ferrets give off both virus and streptococci into the air, blood-agar plates exposed at a distance of 4 feet usually developing in the neighborhood of one hundred colonies of group C streptococcus per plate after three hours' exposure.

The double infection is readily transferred by contact to normal ferrets placed in the same cages with doubly infected donors. When the animals are separated by an air barrier of 4 feet, however, the streptococci fail to be transferred, only a relatively mild air borne virus infection being demonstrable. Apparently air borne streptococci are unable to establish themselves on the normal nasal mucosa. If, however, ferrets previously infected with the influenza A virus are substituted for the normal recipients, a superimposed air borne streptococcic infection usually develops. This predisposing damage to the nasal mucosa may be specific, as chemical agents have thus far failed to produce the necessary local nasal potentiation.

¹⁵ AG210 2 ORC (S 31-41).

¹ Wells, William F., and Wells, Mildred W.: Air Borne Infection, J. A. M. A. 107: 1698 (Nov. 21), 1805 (Nov. 28) 1936.

² Wells, W. F., and Brown, H. W.: Recovery of Influenza Virus Suspended in Air, Science 84: 68 (July 17) 1936, Am J Hyg 24: 497 (Sept.) 1936.

³ Andrews, C. H., and Glover, R. E.: Brit J Exper Path 22: 91 (April) 1941.

Current Comment

CANCER MORTALITY DECLINES IN NEW YORK

The division of cancer control of the New York State Department of Health has announced a decrease in cancer mortality in upstate New York.¹ This decrease is most definite among women aged 25 to 45, in whom a decrease of 10 per cent was noted between 1930 and 1940. In the same period a decrease of approximately 3 per cent occurred in older women. The cancer mortality among men at all ages increased, but this increase was limited to men over 44; in men aged 25 to 44 the rate remained practically unchanged. Changes in the age distribution of the population were sufficient to increase the cancer mortality among males by 14 per cent from 1930 to 1940, in addition to a so-called true increase of 9 per cent, a total of 23 per cent. In women, changes in age distribution should have increased the cancer rate by 12.2 per cent, whereas actually this rate increased by only 8.6 per cent, or a "true" decrease in the cancer mortality among women of 3.6 per cent. Decreases in cancer mortality are particularly significant because they represent a reversal of the upward trend which this rate has pursued consistently for more than half a century. Taken over an eleven year period it is of more significance than are year to year fluctuations. In conjunction with the cancer reporting law² the hope expressed in the press release¹ is particularly significant:

The decrease in cancer mortality among women undoubtedly is due to more early diagnosis and effective treatment, especially of cancer of the breast and uterus. In women, these are the two most frequent forms of cancer, accounting for over a third of all deaths from cancer. At the same time they are readily discovered at an early stage and treatment is highly effective. The decrease in cancer mortality among women, which is now a fact, can probably be continued and intensified in the next ten years.

WEIGHT REDUCTION DIETS

On the street and particularly on the beach are visible the "overweights." In some countries obesity is considered a desirable attribute, but not in this country at this time. Recently, perhaps owing to the change to more revealing clothes, the American public has become "figure conscious." In every public conveyance, in newspapers and magazines and on many a daytime radio program the idea of "the form divine" is hammered into our consciousness. Unquestionably Hollywood has exerted its influence in this regard through the heroines and glamor girls who exhibit their attributes to millions of fascinated eyes. To photograph well they must be thinner than they wish to appear. In years past "Hollywood" reducing diets were promoted, the implication being that the Hollywood diet would produce a Hollywood figure. For the most part, these diets were unscientific; sometimes they were

dangerous. Recently several magazines with a combined circulation of many millions have been publishing diets for reduction of weight. For the most part these diets furnish from 1,000 to 1,500 calories daily and have been planned by persons well trained in dietetics. What attitude should physicians assume toward these diets? Shall we say that the diets are unscientific or dangerous? That would not be true. Should we state that people should never follow a reducing diet without a physician's advice? The magazines themselves urge this. Or should the profession realize that one reason why such dietary suggestions are in demand is because patients have had difficulty in obtaining these diets from their physicians? How many physicians have neglected the importance of diet in the treatment of the patient? "Doctor, I'm overweight. What would you suggest?" "Oh, I'd cut down on the fats, starches and sweets." Why shouldn't this patient welcome some real help from a magazine article? How much time is spent in the curriculum of the medical school in instructing students in the planning of diets? These recently published diets are not those of the dietary faddist. They do not contain the "screw-ball" teachings of William Howard Hay or Benjamin Gayelord Hauser. In general, the diets are excellent. Some may not contain all the protein that they should, and many still require vitamin supplements. But the only good answer that a physician can make to one of these diets is his ability to plan a better one.

DIET AND CIRRHOSIS OF THE LIVER

The relation of dietary protein to health and disease was stressed recently in *THE JOURNAL*,¹ and reference was made to the observation that protein fed to protein depleted dogs may protect them from liver injury due to chloroform anesthesia. A similar important role of dietary protein is seen in a recent report² from the United States Public Health Service. Rats on a low protein ration contracted cirrhosis of the liver in the course of a year following the initiation of the experiment. Another group of animals on the same diet received a 20 per cent solution of alcohol to drink freely in place of water. In this group of rats pathologic liver changes developed which were, on the whole, more severe than in the first group. In two other series of rats on an adequate protein diet, one receiving water and the other 20 per cent alcohol to drink, there were no pathologic changes in the liver. The low sulfur content of the protein poor ration employed suggests a relationship of amino acid content of the diet to the ability of the liver to withstand the toxic effects of orally administered poisons. This view would appear to be in harmony with two known metabolic roles of certain amino acid constituents of proteins; namely, in detoxication mechanisms available to the organism and in promoting the regeneration of injured tissue by providing an adequate supply of the constituents from which new tissue protein is made.

1. News Service Release, New York State Department of Health, Albany, Oct. 1, 1941, Edward S. Godfrey Jr., M.D., commissioner.
2. Experiments in Cancer Reporting, Current Comment, J. A. M. A. 115:136 (July 13) 1940.

1. Dietary Protein and Its Relation to Health and Disease, editorial, J. A. M. A. 117:113 (July 12) 1941.
2. Lillie, R. D.; Daft, F. S., and Sebrell, W. H., Jr.: Cirrhosis of the Liver in Rats on a Deficient Diet and the Effect of Alcohol, Pub Health Rep. 56:1255 (June 13) 1941.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

EXAMINATIONS FOR APPOINTMENT TO NAVY MEDICAL CORPS

Examinations for appointments as acting assistant surgeon for intern training effective on completion of their medical course will be held for all applicants of the senior classes of class A medical schools on Jan. 5 to 9, 1942 inclusive at all of the larger U. S. naval hospitals within the continental limits of the United States. Prospective candidates should communicate with the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., for full information and application forms.

An acting assistant surgeon who has served as an intern in a U. S. naval hospital for twelve months may apply for appointment as assistant surgeon, rank of lieutenant (junior grade), Medical Corps, U. S. Navy, in the regular Navy, or may apply for appointment as a lieutenant (junior grade), Medical Corps, Volunteer General Service Class, U. S. Naval Reserve, and be continued on active duty during the continuation of the present emergency.

The examination for appointment as assistant surgeon, lieutenant (junior grade), Medical Corps, U. S. Navy, will also be held on Jan. 5 to 9, 1942 inclusive at all larger naval hospitals for candidates who are graduates of class A medical schools and who have, or will have within the next four months, completed an internship of twelve months' duration in a hospital accredited for intern training by the Council on Medical Education and Hospitals of the American Medical Association. Interested persons should apply to the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., for full information and application forms.

It is planned to have examinations for appointment as acting assistant surgeons and as assistant surgeons, U. S. Navy, during the months of January, May, August and October of each year, the exact dates to be announced by the Surgeon General of the Navy.

Applicants for appointment in the Medical Corps of the regular Navy are required to be less than 32 years of age at the time of their appointment. The maximum age limit for appointment in the Medical Corps of the Naval Reserve is "50 years of age."

MEDICAL STUDENTS

Junior and senior medical students in good standing in class A medical schools are eligible for appointment as ensigns in the volunteer probationary class H of the Naval Reserve.

Ensigns, T-V.(P.), U. S. Naval Reserve, on successful completion of their junior year of medicine, as well as all other medical students in similar status, may apply for and be examined for appointment as acting assistant surgeon (intern), U. S. Navy. Such appointments will become effective following their graduation from medical school.

Ensigns, H-V.(P.), U. S. Naval Reserve, who do not qualify for appointment as acting assistant surgeon (intern), U. S. Navy, are reappointed, on graduation, lieutenants, junior grade, in the volunteer general service class of the Naval Reserve. It is the present intention of the Bureau of Medicine and Surgery to have such medical officers complete one year's internship before nominating them for active duty assignments.

All applications for appointment as ensign, H-V.(P.), U. S. Naval Reserve, are required to be filed with the commandant of the naval district in which the applicant resides.

THE NEW NAVY MEDICAL CENTER

The Navy Medical Center at Washington, D. C., will move within the next few months to a 250 acre tract just north of Bethesda, Md., where work on a group of new buildings has been going on since July 1939. The new buildings of the Navy Medical Center comprise the main administration building, officers', nurses' and hospital corpsmen's quarters, ward buildings, power plant, laundry and garage. The administration building is impressive, having a tower rising 270 feet above the ground level and twenty stories high. President Roosevelt himself has taken an active part in the architect's drawing and general plans of the building. The main building has a frontage of 266 feet, with three story wings extending 158 feet. Nine floors of the tower will be used also for officer patients and four floors of the tower for enlisted patients. The bed capacity at present is 500 but this will be increased by the addition of wings. A harmonious effect in the various rooms and corridors is produced by the use of terra cotta tile of various colors, and the lobby is lined with marble and trimmed with white bronze.

The main building contains the Navy medical and dental schools, laboratories, libraries, photographic, multigraphing and conference rooms and the entire library of the Surgeon General of the Navy, which is said to be the largest and most important collection of material on naval medicine in the world. The center contains also an auditorium seating five hundred and ninety-six. The main operating room, on the second floor, is lined with Tennessee marble and has a glass enclosed viewing gallery.

The medical school has complete research laboratories. This is a postgraduate school, where young physicians who are graduates of accredited medical schools receive intensive training in medicomilitary subjects, tropical diseases and the problems of submarine and aviation activities being particularly stressed. The actual project of construction of the new school has been carried out under the general direction of Rear Admiral Ross T. McIntire and by the chief of the Bureau of Yards and Docks, Rear Admiral Ben Morcell of the Civil Engineer Corps, U. S. Navy.

NEW NAVY HOSPITALS AND DISPENSARIES

The Secretary of the Navy announced October 15 that the Bureau of Medicine and Surgery of the Navy is bringing to completion new navy hospital facilities which are in keeping with the navy's expansion into a two ocean navy. Following are the new naval hospitals:

NEW NAVY HOSPITALS

(a) U. S. Naval Hospital at Aiea, near Pearl Harbor, T. H., is under construction, at a cost of \$2,600,000. The hospital will provide 400 beds, with major hospital facilities. In connection with the hospital is a new naval medical supply storehouse.

(b) U. S. Naval Hospital, Long Beach, Calif. A 300 bed hospital, costing \$2,500,000 and with major hospital facilities, is to be built at Long Beach. Plans are being completed for this institution.

(c) U. S. Naval Hospital, Key West, Fla. Plans are being completed for a 150 bed hospital of permanent construction, at a cost of \$1,000,000.

(d) U. S. Naval Hospital, Coco Solo, C. Z. Under construction is a 150 bed hospital with complete facilities at a cost of \$1,100,000.

(e) U. S. Naval Hospital, Balboa, C. Z. A temporary type hospital of 120 beds is under construction at a cost of \$750,000.

(f) U. S. Naval Hospital, Quantico, Va. On July 1, 1941 the former post-sick quarters became a naval hospital by congressional legislation.

(g) U. S. Naval Hospital, Charleston, S. C. Under a grant of \$645,000, the new naval hospital at Charleston will be completed. The capacity will be 200 beds. The hospital was begun in 1940 as a WPA project.

(h) U S Naval Hospital, Jacksonville, Fla. The 200 bed hospital facility at the Naval Air Station, Jacksonville, was officially designated as a naval hospital on July 1, 1941. The hospital is of temporary construction and provides major hospital facilities.

(i) U S Naval Hospital, Corpus Christi, Texas. The 400 bed hospital facility at Corpus Christi was officially designated as a naval hospital on July 1, 1941.

(j) U S Navy Medical Center, Bethesda, Md. (Washington, D. C.) The 500 bed Navy Medical Center is nearly completed at Bethesda, Md.

(k) U S Naval Hospital, Pensacola, Fla. The new hospital at the Naval Air Station is nearly completed. About 200 beds will be provided.

DISPENSARIES AND HOSPITAL FACILITIES

(a) Naval Air Station, Argentia, Newfoundland. A dispensary of 150 beds with hospital facilities is to be constructed immediately at a cost of \$500,000.

(b) Marine Corps Base, New River, N. C. A post sick quarters of 200 beds will be constructed with complete hospital facilities.

(c) Marine Corps Aviation Base, Neuse River, N. C. A post sick quarters of 200 beds will be built. Complete aviation medical and hospital facilities will be provided.

(d) Naval Operating Base Norfolk, Va. A modern 150 bed dispensary will be built at the Naval Training Station, Norfolk, at a cost of \$375,000.

(e) Naval Station, Tutuila, Samoa. A modern dispensary of 50 beds will be constructed at Tutuila at a cost of \$180,000.

(f) Naval Station, Charlotte Amalie, Virgin Islands. A 30 bed modern dispensary is under construction at a cost of \$145,000.

(g) Naval Air Station, Barber's Point, T. H. A 150 bed dispensary will be constructed at a cost of \$400,000.

(h) Naval Air Station, Quonset Point, R. I. A dispensary of 100 beds is nearly completed.

(i) Naval Air Station, San Juan, P. R. A modern 44 bed dispensary is under construction.

(j) Naval Air Station, Alameda, Calif. A dispensary of 100 beds is under construction.

(k) Naval Air Station, Kodiak, Alaska. A modern dispensary of 100 beds is under construction.

(l) Naval Air Station, Kaneohe, T. H. A modern dispensary of 100 beds is under construction.

(m) Naval Air Station Trinidad. A dispensary of 150 beds will be built.

(n) Naval Air Station, Unalaska, Alaska. A dispensary of 120 beds, with hospital facilities, will be built at a cost of \$575,000.

MEDICAL SUPPLY DEPOTS

(a) Brooklyn. Under a recent appropriation of \$600,000, the Brooklyn Medical Supply Depot will be further extended along High Street.

(b) Newport, R. I. A medical supply storehouse will be built at a cost of \$200,000.

(c) Oakland, Calif. A large naval medical supply depot is nearly completed.

(d) Pearl Harbor, T. H. In connection with the new naval hospital at Aiea, a medical supply storehouse is under construction at a cost of \$275,000.

HOSPITAL CORPS TRAINING SCHOOLS

In connection with the program of providing trained medical personnel for the augmented Navy, a new Hospital Corps Training School with a capacity of 400 students will be constructed at Great Lakes, Ill., and the existing schools at Norfolk and San Diego will be increased.

EXPANSION OF EXISTING NAVAL HOSPITALS

(a) U S Naval Hospital, Chelsea, Mass. A new wing of about 90 beds is under construction at a cost of \$250,000.

(b) U S Naval Hospital Philadelphia. A large supply storehouse is under construction, costing \$100,000.

(c) U S Naval Hospital Annapolis, Md. A new wing is being added at a cost of \$475,000.

(d) U S Naval Hospital, Quantico, Va. An isolation ward building is under construction at a cost of \$65,000.

(e) U S Naval Hospital, San Diego, Calif. New sick officers' quarters and outpatient clinic will be built at a cost of \$275,000.

(f) U S Naval Hospital, Mare Island, Calif. A new wing is under construction costing \$475,000.

(g) U S Naval Hospital, Puget Sound Wash. A new galley and mess hall and a ward wing are under construction, at a total cost of \$725,000.

ARMY COLD WEATHER HEADGEAR

The results of experiments on clothing for cold climates made during the Byrd Antarctic expeditions have been used in the designs of new headgear for soldiers, standardized by the Army Quartermaster Corps, the War Department has announced. An olive-drab knitted cap, a stocking cap and a cloth hood, designed for protection of the head and neck, will be used by soldiers this winter.

Adapted from the Eskimo parka for Army use, the hood is made of wind and water resistant poplin. Tightening a drawstring brings the hood together in front to cover almost the entire face. The attached shawl protects the back of the soldier's head and fits down over the top of his shoulders.

The new cap, which may be worn up over the ears, includes a snug shawl which may be turned down when necessary to protect the ears and neck.

During his Antarctic experiments, Dr. Paul Siple developed a formula to measure the effects of wind on the heat loss of the body. He found that, whereas a person wearing only a medium heavy sweater is reasonably warm at zero temperature, he quickly becomes cold if there is a wind of even 10 miles an hour velocity, because his heat loss increases in proportion to the increase in the velocity of the wind.

SPARKPROOF SHOES FOR ARMORED TROOPS

Sparkproof shoes are among the latest types of footwear being tested by the Army. The new shoes are designed for soldiers who dispense gasoline and other inflammable materials, particularly in the Armored Force, where a spark may be disastrous.

Vulcanized fiber instead of metal is being used for washers in the heels of these new shoes, and the nails are made of a nonsparking metal. Shoes made according to this new design are being given a thorough workout by soldiers of a gasoline and oil battalion in the Armored Force. If they prove satisfactory, all soldiers who perform duties in which a spark may be dangerous will be provided with these sparkproof shoes.

BUILDING UP A BLOOD PLASMA BANK

The American Red Cross is conducting a program to build up a blood plasma bank for use of the military forces with sufficient reserve for civilian catastrophe aid. The program already has been established in seven cities and will soon be expanded to a total of twenty-two chapters. The American Red Cross has already completed a bank of 15,000 blood plasma units and expects to build the initial bank to 200,000 units. Capt. Charles S. Stephenson, Medical Corps, U. S. Navy, has just completed a tour of inspection of the medical and research centers of England made in cooperation with the National Research Council, the Medical Research Council of Great Britain and Canadian research organizations. In his report to the Secretary of the Navy, Captain Stephenson said that the use of dried blood plasma for emergency administration to patients in the field suffering from traumatic shock and loss of blood has been highly effective in saving life. He further stated that the biologic laboratories of the United States have equipment for preparing dried plasma and are now preparing several hundred packages each week and will be able within a month to process several thousand quarts of blood each week. The real problem in the United States, he said, is to develop a sufficiently large list of blood donors to permit this work to be carried on effectively. Dried plasma is packaged by the biologic laboratories with the proper amount of distilled water to restore the essential fluidity, and it is then available for immediate use either in hospitals or in the midst of battle or bombing raids of cities.

RED CROSS TO TEACH HOME NURSING

The American Red Cross classes in home nursing, which last year taught 80,000 women and girls, will be expanded in the next year to teach 500,000 American women in home nursing. This is now a new undertaking of the American Red Cross, Chairman Davis said, as more than 1,000,000 persons have received home nursing certificates since the home nursing program began in 1914. The course takes six weeks, covering twenty-four hours of class instruction, of which 70 per cent consists of practice work, making use only of such equipment as the average family would be expected to have. The care of babies, children and the aged and positive health measures are stressed. Under no circumstances, however, does the certificate presented for completion of the course entitle the receiver to serve outside her home for remuneration, nor is the instruction given intended to eliminate the need of professional or nursing assistance. The women receiving this home nursing instruction, Chairman Davis said, will be a vital adjunct to the overtaxed nursing, medical and hospital facilities and will be of great value to the nation in the event of epidemics or national defense emergencies.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY WAR DEPARTMENT

The following additional medical reserve officers have been ordered to extended active duty by the War Department, Washington, D. C.:

ABELE, John Frank, Captain, San Diego, Calif.
ATKINSON, Robert Henry, 1st Lieut., Walter Valley, Miss.
BAKER, John Samuel, 1st Lieut., Los Angeles
BALLANTINE, Henry T., 1st Lieut., Chestnut Hill, Mass.
BARNHILL, John Robert, 1st Lieut., Bakersfield, Calif.
BERARD, Louis Nil, Captain, St. Louis
BROWN, John Welch, 1st Lieut., San Francisco
DURNIN, William George, 1st Lieut., Bottineau, N. D.
GRIFFIN, John Gordon, 1st Lieut., Rochester, Minn.
HARLEY, Robison D., 1st Lieut., Rochester, Minn.
HUNTINGTON, Camp Stanley, 1st Lieut., Washington, D. C.

FAZIO, Michael G., 1st Lieut., Brooklyn
JOHNSON, Elgie K., 1st Lieut., Columbus, Ohio
MARCH, Harry N., Captain, Grass Valley, Calif.
MILFORD, Albert F., Jr., 1st Lieut., Ypsilanti, Mich.

Orders Revoked

LAMON, John Daniel, Jr., Captain, Albuquerque, N. M.
LOGUE, Robert Bruce, 1st Lieut., Atlanta, Ga.
MOODY, Leonard Wood, 1st Lieut., Angwah-ching, Minn.
MORROW, Robert Prosser, Jr., 1st Lieut., New Orleans.
ODGERS, Stephen Lafayette, 1st Lieut., Chicago
PASCUCCHI, Lucien Michele, 1st Lieut., New York
RECKLER, Sidney, Captain, Denver.
ROSS, Raleigh R., 1st Lieut., Lockhart, Texas.
SIMONSON, Eric Emil, 1st Lieut., Castlegate, Utah.
TENAGLIA, Eutimio Domenico, Major, Clayton, Mo.
WEBB, Robert W., 1st Lieut., Dallas, Texas
WEXLER, Nathan Harold, Captain, Brooklyn.
WIENER, Morris Frederick, Captain, Brooklyn.
ZUCK, Frederick N., 1st Lieut., Rochester, N. Y.

NLEFF, Richard Scudder, 1st Lieut., Boston.
ROBERTS, Harold K., 1st Lieut., St. Louis
WILKINSON, Thomas C., Captain, Pittsburgh
WOLFF, Bruce N., 1st Lieut., Gettysburg, Pa.

FIRST CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, First Corps Area, which comprises the states of Maine, Vermont, New Hampshire, Rhode Island, Massachusetts and Connecticut:

CARIGNAN, Roland Z., 1st Lieut., Dover, N. H., Fort Devens, Mass.
DOUGHERTY, John F., 1st Lieut., Bath, Maine, Springfield, Mass.
DUSTON, Charles H., 1st Lieut., Westford, Mass., Camp Edwards, Mass.
GLENN, William W. L., 1st Lieut., Boston, Army Base, Boston
HYMAN, Mayer H., 1st Lieut., Boston, Fort Devens, Mass.

JORDAN, Frank J., 1st Lieut., Stoughton, Mass., Army Base, Boston.
LARKIN, Donald F., 1st Lieut., Waterville, Maine, Fort H. G. Wright, N. Y.

Orders Revoked

ARCHAMBAULT, Henry A., 1st Lieut., Barre, Vt.
BELMONT, Ralph S., 1st Lieut., Sanford, Maine.
BERMAN, Leo, 1st Lieut., Boston
BULMANN, Henry, Jr., 1st Lieut., South Hero, Maine.
DORSEY, Joseph F., 1st Lieut., Boston
DROBNES, Sidney, 1st Lieut., Norwich, Conn.
HALL, Walter L. H., 1st Lieut., Old Town, Maine.
HOPPER, Edward B., 1st Lieut., Glenbrook, Conn.
KRONICK, Macey, 1st Lieut., Greenfield, Mass.

SECOND CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Second Corps Area, which comprises the states of New York, New Jersey and Delaware:

BODIAN, Martin, 1st Lieut., Brooklyn, Fort Benning, Ga.
BODKIN, Edmund C., 1st Lieut., Bronx, N. Y., Fort Bragg, N. C.
BOULTON, Dale C., 1st Lieut., New York, Fort Bragg, N. C.
BRANNAN, Gordon Robert, 1st Lieut., Middletown, N. Y., Fort Benning, Ga.
BROGAN, Francis B., 1st Lieut., Paterson, N. J., Camp Blanding, Fla.
CASEY, Francis G., 1st Lieut., Brooklyn, Fort Hancock, N. J.
CHARTOCK, Hyman, 1st Lieut., Brooklyn, Fort Monmouth, N. J.
DEHOFF, John B., 1st Lieut., New York, Fort Monmouth, N. J.
DEMO, Robert A., 1st Lieut., Rochester, N. Y., Plattsburg Barracks, N. Y.
DOCTOROW, William M., 1st Lieut., New York, Fort Bragg, N. C.
ESPINOZA, David V., 1st Lieut., Poughkeepsie, N. Y., Camp Davis, N. C.
FENTON, Alan Harold, 1st Lieut., Mount Vernon, N. Y., Fort Bragg, N. C.
FERNBACH, Paul A., 1st Lieut., Cheektowaga, N. Y., Fort Bragg, N. C.
HARBESON, James P., III, 1st Lieut., West Collingswood, N. J., Fort Knox, Ky.
HARROW, Douglas G., 1st Lieut., New York, Camp Blanding, Fla.
JACOBS, Ralph, 1st Lieut., Brooklyn, Fort McClellan, Ala.
JANNARONE, Lewis H., 1st Lieut., Belleville, N. J., Fort Benning, Ga.
KLATNER, John J., Jr., 1st Lieut., Buffalo, Plattsburg Barracks, N. Y.
LANZILLO, James L., 1st Lieut., Troy, N. Y., Camp Davis, N. C.

LICHTENBERG, Walter, 1st Lieut., New York, Fort Niagara, N. Y.
LIZZI, Arthur J., 1st Lieut., Brooklyn, Camp Davis, N. C.
LOVELOCK, Francis J., 1st Lieut., New York, Fort Niagara, N. Y.
LUSTBADER, Philip F., 1st Lieut., Brooklyn, Fort Tilden, N. Y.
MARCUS, Harold, 1st Lieut., Brooklyn, Camp Davis, N. C.
McFARLIN, Raymond Thomas, 1st Lieut., Bronx, N. Y., Fort Knox, Ky.
MENDONSA, Lawrence E., 1st Lieut., New York, Fort Jackson, S. C.
METZGER, William R., 1st Lieut., Bronx, N. Y., Fort Jackson, N. C.
ORFUS, Abraham J., 1st Lieut., New York, Fort Dix, N. J.
PENNINGTON, Glenn W., 1st Lieut., New York, Fort Bragg, N. C.
PICKAR, Gabriel, 1st Lieut., Brooklyn, Fort Dix, N. J.
PLASSE, David H., Captain, New York, Fort Knox, Ky.
RICHARD, Donat R., 1st Lieut., Brooklyn, Fort Bragg, N. C.
ROGAN, Henry Aaron, Captain, Pleasantville, N. Y., Camp Davis, N. C.
ROMANO, Frank R., 1st Lieut., Bronx, N. Y., Camp Stewart, Ga.
ROSE, Anthony, 1st Lieut., Bronx, N. Y., Fort Bragg, N. C.
SCHNEIDER, Harry J., 1st Lieut., Long Branch, N. J., Camp Livingston, La.
SHIELDS, Charles D., Captain, Buffalo, Camp Croft, S. C.
SHIFF, Nathan A., 1st Lieut., Bronx, N. Y., Fort Bragg, N. C.
STERNBERG, Waldemar C. A., 1st Lieut., Clifton Springs, N. Y., Fort Benning, Ga.
SULMONETTI, William B., 1st Lieut., Larchmont, N. Y., Fort Knox, Ky.
TRIPPE, Morton F., 1st Lieut., Asbury Park, N. J., General Dispensary, New York
WHALEN, Edward P., 1st Lieut., Odgensburg, N. Y., Fort Bragg, N. C.
YEILIN, Charles H., 1st Lieut., Roselle, N. J., Fort McClellan, Ala.
YESNER, Bernard, 1st Lieut., Richmond Hills, L. I., N. Y., Fort Bragg, N. C.

Orders Revoked

HERRINGTON, Lee R., Jr., 1st Lieut., Camp Shelby, Miss.
KASSAN, Robert Jacob, 1st Lieut., West Point, N. Y.

KUFLIK, William Eggert, 1st Lieut., Fort Knox, Ky.
SIMLANSKY, Philip F., 1st Lieut., Air Base, Orlando, Fla.

THIRD CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Third Corps Area, which comprises the states of Pennsylvania, Virginia, District of Columbia and Maryland:

FSTILL, Don Vincent, 1st Lieut., South Boston, Va., Camp Custer, Mich.
GRYNKEWICH, Serge Elias, 1st Lieut., Tamaqua, Pa., Camp Lee, Va.
HIMMELWRIGHT, Gafel G., 1st Lieut., Newport News, Va., Camp Lee, Va.

LEWIS, Paul Macellon, 1st Lieut., Pittsburgh, Aberdeen Proving Ground, Md.
LUKAS, Alexander Benjamin, 1st Lieut., Shenandoah, Pa., Indiantown Gap Military Reservation, Pa.
MOYER, Dwight Lester, 1st Lieut., Hatfield, Pa., Fort Story, Va.
MULHOLLAND, Richard Francis, 1st Lieut., Pittsburgh, Indiantown Gap Military Reservation, Pa.
POMEROY, James McMahon, 1st Lieut., Clester, Pa., Fort George G. Meade, Md.
POPIELARSKI, Joseph Thomas, 1st Lieut., Bridgeport, Pa., Aberdeen Proving Ground, Md.

POSTLETHWAIT, Raymond Woodrow, 1st Lieut, Palmerton, Pa, Fort Myer, Va
 REPPUN, John Iorwerth Frederick, 1st Lieut, Homestead, Pa, Fort Belvoir, Va
 ROUZER, Alvin Victor, 1st Lieut, Connellsville, Pa, Fort George G Meade, Md
 SCANLAN, Thomas Joseph Daniel, 1st Lieut, Shillington, Pa, Camp Lee, Va

SCHNALL, Charles, 1st Lieut, Philadelphia, Indiantown Gap Military Reservation, Pa
 SCULLY, John Pendleton, 1st Lieut, Pittsburgh, Indiantown Gap Military Reservation, Pa
 THOMPSON, William Taliaferro Jr, 1st Lieut, Richmond, Va, Camp Lee, Va
 WALL, Norman Melvin, 1st Lieut, Girardville, Pa, Fort Eustis, Va
 WILSON, John Francis, 1st Lieut, West Philadelphia, Pa, Fort George G Meade, Md

Orders Revoked

HEIM, Hugh Wilson, 1st Lieut, Schuylkill Haven, Pa
 PROCOPIO, James Joseph, 1st Lieut, Shamokin, Pa

STONE, Reuben Edwin, Captain, Glenn Dale Sanatorium Glenn Dale, Md

FOURTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Fourth Corps Area, which comprises the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana:

BLOUNT, Robert Eames, 1st Lieut, Fort Lauderdale, Fla, Fort McClellan, Ala
 BURTON, John P, 1st Lieut, New Orleans, Fort Bragg, N C
 CHAMBERS, Wallace L, Captain, Pickens, Miss, Camp Wheeler, Ga
 CLARK, James A, Jr, 1st Lieut, Ruleville, Miss, Fort Bragg, N C
 DIAN, Joseph Francis, 1st Lieut, Carville, La, Camp Blanding, Fla
 GIDDENS, Isbn S, 1st Lieut, Millen, Ga, Camp Forrest, Tenn
 GRAVES, John Humphrey, 1st Lieut, Memphis, Tenn, Camp Forrest, Tenn
 GROOVER, Marshall E, 1st Lieut, Quitman, Ga, Camp Forrest, Tenn
 HAMMOND, Gaines W, 1st Lieut, Spartanburg, S C, Camp Stewart, Ga

HENRY, Hector Himel, 1st Lieut, Durham, N C, Camp Shelby, Miss
 HUNTER, William B, Major, Lillington, N C, Camp Shelby, Miss
 INGRAM, Aldean Starr, 1st Lieut, Griffin, Ga, Camp Shelby, Miss
 JOHANSEN, Frederick A, Major, Carville, La, Camp Livingston La
 JOHNSON, John R, Major, Jackson, Miss, Camp Blanding Fla
 McAFEE, John Colbert, 1st Lieut, Macon, Ga, Camp Blanding, Fla
 McKENZIE, Jack A, 1st Lieut, Miami, Fla, Camp Blanding, Fla
 SAMPOGNARO, Vincent J, 1st Lieut, Monroe, La, Camp Wheeler, Ga
 SAMSON, Martin F, 1st Lieut, New Orleans, Camp Stewart, Ga
 SMITH, Charles R, 1st Lieut, Dawson, Ga, Camp Livingston La
 STANDER, Alvin A, 1st Lieut, Baton Rouge, La, Fort Bragg, N C
 STOKES, Lowell L, 1st Lieut, Lake City, Fla, Fort Benning, Ga
 TERRELL, Kenneth D, 1st Lieut, Prentiss, Miss, Camp Blinding, Fla
 WADLINGTON, James E, 1st Lieut, Florence, Miss, Camp Shelby, Miss
 WHITFIELD, Frederick S, 1st Lieut, Columbia, La, Fort McClellan, Ala
 WOOD, James A, Lieut Colonel, Macon, Ga, New Orleans
 ZIEMAN, John Arthur, 1st Lieut, Mobile, Ala, Camp Davis, N C

Orders Revoked

ASKEW, Rufus A, 1st Lieut, Atlanta, Ga
 BURKHALTER, W D, Captain, Memphis, Tenn
 GILL, Euclid Borland, 1st Lieut, New Orleans
 IOWRY, Harvey McL, 1st Lieut, Memphis, Tenn

POOLE, William L, 1st Lieut, Fairfield, Ala
 SLIPAKOFF, Leon, 1st Lieut, New Iberia, La
 WILKES, John Burwell, 1st Lieut, Durant, Miss
 WILSON, John Mc, 1st Lieut, Memphis, Tenn

SEVENTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Seventh Corps Area, which comprises the states of North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri, Arkansas and Wyoming:

AGNEW, James Ward, Captain, Iowa City, Fort Riley, Kan
 BAUER, Frank Louis, 1st Lieut, Shenandoah, Iowa, Corps Area Service Command Station Hospital, Camp J T Robinson, Ark
 CHAMBERS, James Quarles, Jr, Captain, Kansas City, Mo, Corps Area Service Command Station Hospital, Fort F E Warren, Wyo
 CHUNN, Stanley Sylvester, 1st Lieut, Pipestone, Minn, Corps Area Service Command Station Hospital, Fort Leavenworth, Kan
 CLARKE, Harry, Lieut Col, Seward, Neb, Antiaircraft Training Center, Camp Hulen, Texas
 EPSTEIN, Joseph George, Captain, Wadsworth, Kan, Corps Area Service Command Induction Station, Jefferson Barracks, Mo
 FOOTE, Donovan Bryne, 1st Lieut, Hastings, Neb, Corps Area Service Command Station Hospital, Fort Crook, Neb
 FRACASSE, John, 1st Lieut, Des Moines, Iowa, Corps Area Service Command Station Hospital, Fort Des Moines, Iowa
 FREEDMAN, Albert Louis, 1st Lieut, Iowa City, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo
 GANSCHOW, John Henry, 1st Lieut, Hedrick, Iowa, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo
 GIER, Jacob Benjamin, 1st Lieut, Wadsworth, Kan, Corps Area Service Command Induction Station, Jefferson Barracks, Mo
 GINSBERG, William, Major, St Paul, Antiaircraft Training Center, Camp Hulen, Texas
 GOLDEN, Robert Fred, Captain, Rochester, Minn, Corps Area Service Command Station Hospital, Camp J T Robinson, Ark
 HALL, Frank Wilburn, Captain, Cape Girardeau, Mo, Corps Area Service Command Station Hospital, Fort F E Warren, Wyo
 HANSON, Carl Alfred, 1st Lieut, Minneapolis, Corps Area Service Command Station Hospital, Fort Snelling, Minn

HARRIS, Karl Sanders, 1st Lieut, Iowa City, Fort Riley, Kan
 HEDEMARK, Homer Harold, Captain, Thief River Falls, Minn, Fort Leonard Wood, Mo
 HOGE, Marlin Boyd, 1st Lieut, Fort Smith, Ark, Corps Area Service Command Station Hospital, Camp J T Robinson, Ark
 IDSTROM, Linneus Godfrey, 1st Lieut, Ahwah ching, Minn, Fort Snelling, Minn
 KANTOR, Julius Max, 1st Lieut, Kansas City, Mo, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo
 KERSHNER, Calvin Myles, 1st Lieut, Brookings, S D, Fort Snelling, Minn
 LONG, Fred Peyton, 1st Lieut, North Platte, Neb, Corps Area Service Command Station Hospital, Fort Riley, Kan
 NEVELN, Lowell Claus, 1st Lieut, Middle, Iowa, Corps Area Service Command Station Hospital, Fort Snelling, Minn
 PATTON, Bernard W, Captain, Des Moines, Iowa, Corps Area Service Command Induction Station, Camp J T Robinson, Ark
 PRESTON, Albert, Jr, 1st Lieut, Kansas City, Mo, Corps Area Service Command Station Hospital, Fort Riley, Kan
 RALSTON, Donald Everett, 1st Lieut, Minneapolis, Fort Snelling, Minn
 SCHUMAKE, Lawrence Powell, 1st Lieut, St Louis, 4th Cavalry Brigade, Fort Riley, Kan
 SELINGER, Bernard, 1st Lieut, Red Lake, Minn, 368th Infantry, Fort Huachuca, Ariz
 SPRADLING, Richard Lee, 1st Lieut, Lincoln, Neb, Corps Area Service Station Hospital, Fort Omaha, Neb
 STROUGH, La Vern Craig, 1st Lieut, Beatrice, Neb, Corps Area Service Command Station Hospital, Fort Snelling, Minn
 THOMPSON, Carl Oliver, 1st Lieut, Hendricks, Minn, Corps Area Service Command Station Hospital, Fort F E Warren, Wyo
 WRAY, Robert Montimer, 1st Lieut, Cedar Rapids, Iowa, Fort Leonard Wood, Mo
 YELLEN, Benjamin Louis, 1st Lieut, Wadsworth, Kan, Corps Area Service Command Station Hospital, Fort Riley, Kan
 ZELIGS, Isadore, 1st Lieut, Iowa City, Corps Area Service Command Station Hospital, Fort Riley, Kan

Orders Revoked

DWORKIN, Shnell, 1st Lieut, St Louis
 MOORE, Ernest M, Jr, 1st Lieut, Higginsville, Mo

NELSON, Nesmith P, Captain, Brainerd, Minn
 WATKINS, Lucien A, 1st Lieut, Leavenworth, Kan

Relieved from Extended Active Duty

ANDERSON, Bruce Murat, 1st Lieut, Rochester, Minn, Corps Area Service Command Station Hospital, Camp J T Robinson, Ark
 BECHTOLD, Frederick Frank, 1st Lieut, St Louis, Jefferson Barracks, Mo
 FEIST, George Van, Lieut Colonel, Kansas City, Mo, Curtiss Wright Technical Institute, Glendale, Calif

HALLADAY, George John, 1st Lieut, Brainerd, Minn, Camp J T Robinson, Ark
 HODGSON, Frank Harrison, 1st Lieut, Kansas City, Mo, Fort Leonard Wood, Mo
 KANE, Thomas Edward, 1st Lieut, Boone, Iowa, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo

ORGANIZATION SECTION

OFFICIAL NOTES

EXHIBITS FROM HEADQUARTERS

November 1-30.—Phoenix, Ariz. (for use throughout the state by the Committee on Public Health Education of the Arizona State Medical Association:

Question and answer exhibit.

November 3-7.—American College of Surgeons, Boston (annual meeting):

Information About Hospitals.

November 10-13.—Southern Medical Association, St. Louis (annual meeting):

Nutritionally Improved Flour.

November 17-30.—Cleveland Health Museum, Cleveland:

Nutritionally Improved Flour.

November 21-22.—Pacific Coast Section of the American Student Health Association, San Francisco:

Use and Abuse of the Barbiturates.
Chemistry of the Sulfonamides.

ADDRESSES BY THE PRESIDENT

Dr. Frank H. Lahey, President of the American Medical Association, has been scheduled to deliver the following addresses during November:

November 7.—American College of Surgeons, Boston.

November 10-11.—Southern Medical Association, St. Louis.

November 18.—Medical Society of Post of Camp Devens, Ayer, Mass.

November 25.—Berkshire County District Medical Society, Pittsfield, Mass.

WOMAN'S AUXILIARY

Georgia

Mrs. J. M. Barnett, Albany, Ga., one of the charter members and past president of the Dougherty County auxiliary, was recently selected as Dougherty County's outstanding woman citizen. Mrs. Barnett is active in many other community and national woman's organizations.

Mrs. W. E. Simmons, Metter, at a recent meeting in Savannah, was elected president of the Woman's Auxiliary to the First District Medical Society. The speakers at this meeting were Dr. Robert V. Schultz, of the state department of health; Dr. Allen H. Bunce, Atlanta, president of the Medical Association of Georgia, and Dr. James N. Brawner, Atlanta.

New Jersey

The Woman's Auxiliary to the Camden County Medical Society met, May 1, with Mrs. Lawrence L. Glover presiding. Eighty-two persons were present and three guests of honor—Mrs. R. J. McDonald, state auxiliary president; Mrs. James Hunter, former state president, and Mrs. William Raleigh, former Camden County president. Mrs. Oswald R. Carlander, recently elected state auxiliary president, who is also president of the New Jersey Division of the American Association of University Women, asked for continued cooperation of the auxiliary members. Mrs. L. R. Wilson, treasurer, reported that \$378.40 was realized from the Fashion Show and Card Party. Donations given to several Camden County organizations amounted to \$317.

Pennsylvania

Dr. Edward L. Bortz, president of the Philadelphia County Medical Society, Philadelphia, was the speaker at the health education day of the Berks County auxiliary recently. He discussed diabetes and showed colored motion pictures of Camp Firefly, a camp for diabetic children sponsored by the John B. Deaver Auxiliary of the Lankenau Hospital. This beautiful camp is along the Perkiomen Creek, and its activities, which are directed by Dr. Bortz, range from teaching children to weigh their own food and to administer their own insulin to teaching them carefully supervised outdoor sports and handicrafts.

Texas

The twenty-third annual session of the Woman's Auxiliary to the State Medical Association of Texas was held in Fort Worth, May 12-15, 1941 with a registration of four hundred and forty-five. A dinner honoring Mrs. William Hibbitts, members of the state executive board, past presidents of the

state auxiliary, county presidents, nominating committee and their husbands was held at the Blackstone Hotel. The local chairman of arrangements was Mrs. A. B. Pumphrey, assisted by Mrs. W. Frank Armstrong and Mrs. J. R. Wise.

On Wednesday, the business meeting of the auxiliary was held at the Blackstone, with Mrs. William Hibbitts presiding. Mrs. W. R. Thompson installed the new officers, following which Mrs. Hibbitts handed the gavel over to Mrs. S. F. Harrington, Dallas, the incoming president.

Falls County auxiliary entertained members of the Falls County Medical Society, May 6, with a picnic supper and fish fry at the Marlin Country Club.

The following officers of the Hidalgo County auxiliary were elected at the May meeting: president, Mrs. D. C. Hyder, Donna; vice president, Mrs. H. E. Whigham, McAllen; second vice president, Mrs. L. H. Moore, McAllen; secretary-treasurer, Mrs. M. R. Lawler, Mercedes. Mrs. G. A. Guerra gave a talk on dysentery. Mrs. Emma McCrary reviewed Hergesheimer's book "Java Head."

The auxiliary to the medical society of Liberty and Chambers counties entertained with a tea recently at the home of Mrs. E. R. Richter, Dayton. June 12 it met at the home of Mrs. Frank S. Griffin Jr. of Liberty. The auxiliary won the silver cup for the largest increase in membership of any county auxiliary; won third place in exhibits at the state auxiliary meeting and was one of eleven county auxiliaries that reported 100 per cent of its membership readers of THE JOURNAL. The following officers were installed: Mrs. Jack Bevil, president; Mrs. A. R. Shearer, vice president; Mrs. R. C. Bellamy, secretary-treasurer, and Mrs. W. H. Bridges, parliamentarian.

Washington County auxiliary entertained two hundred women with a reception at Brenham, May 26. Mrs. Robert A. Hasskarl, president of the district auxiliary, and Mrs. N. D. Jarrell, incoming president of the county auxiliary, presided at the tea table. Other members of the auxiliary assisted in serving refreshments. Musical selections were given by Mesdames Jerry Hicks, Wayne Alexander, H. L. Steinbach and Kate E. McAdam. Mrs. C. E. Southern, Burton, retiring president, installed the following new officers: Mrs. N. D. Jarrell, president; Mrs. W. F. Hasskarl, vice president; Mrs. Fred Graber, recording secretary; Mrs. E. V. Pazdral, corresponding secretary; Mrs. George Zeiss, treasurer; Mrs. C. E. Southern, parliamentarian; Mrs. N. L. Schiller, press reporter, and Mrs. Arthur Becker, historian.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

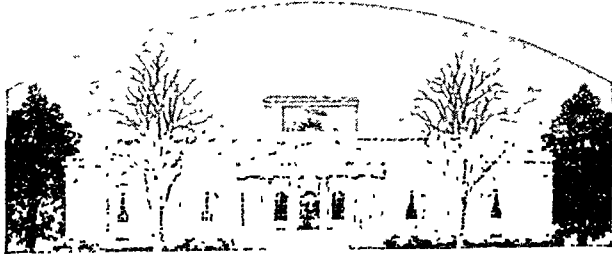
District Meetings.—The First Councilor District Medical Society was addressed in Jonesboro, October 15, among others, by Dr. Ralph M. Stuck, Denver, on "Care of the Simple Head Injury."—The speakers before the Second District Medical Society in Batesville, October 13, included Drs. William Decker Smith, Texarkana, on "Surgery of the Colon"; Merlin J. Kilbury, Little Rock, "Fungous Infections," and Francis Walter Carruthers, Little Rock, "Surgery of the Knee." Dr. Herbert Fay H. Jones, Little Rock, president of the state medical society, also spoke.—The Fifth Councilor District Medical Society was addressed in Camden, October 9, by Drs. Elliott Mendenhall and Robert R. Shaw, Dallas, Texas, on diseases of the chest. Hon. John L. McClellan, Camden, gave a talk entitled "Our American Heritage."

CONNECTICUT

Changes in Health Officers.—Dr. Roy V. Sanderson has been appointed health officer of Winsted to succeed Dr. Francis Gallo. Dr. Gilbert E. Moore is the acting health officer of Darien to fill the vacancy caused by the death of Dr. William H. Slaughter. Dr. Alfred Schiavetti, Stafford Springs, has been named acting health officer of West Willington during the absence of Dr. Frank B. Converse.

GEORGIA

New Home of Fulton County Medical Society.—The new Academy of Medicine of the Fulton County Medical Society, Atlanta, now under construction, will be dedicated on December 15. Dr. Fred W. Rankin, Lexington, Ky., President-Elect of the American Medical Association, will be the guest speaker. The new building supplants the old academy, which was located at 38 Prescott Street, N. E., purchased by the society in 1922. Excavation began June 10. The building is of Greek revival architecture and the exterior finish is of



Academy of Medicine in Atlanta.

stucco on brick. It is fireproof and air conditioned. The cost of the building and lot will be \$140,000, most of which was raised by donations from the members. The building will contain the offices of the society, the offices of the Medical Association of Georgia, medical library and an auditorium with a seating capacity of 300, together with auxiliary headquarters, lounge rooms, recreation rooms, kitchen and dining room. Features of the decorative plans of the building include the installation of memorials to past presidents and members of the Fulton County Medical Society who have been active in its development.

ILLINOIS

Society News.—Dr. Charles S. White, Washington, D. C., discussed "Use of Blood Plasma in Surgery" before the Peoria Medical Society on October 14.—The Sangamon County Medical Society was addressed in Springfield, October 2, by the following Decatur physicians: Clarence E. Bell, "Observations on Dehydration Therapy"; Scott J. Wilkinson, "Clinical Study of Respiratory Infections in Children," and Dean F. Stanley, "Complications of Coronary Thrombosis."—Dr. James L. Mudd, St. Louis, addressed the Adams County Medical Society in Quincy, October 13, on "Empyema: Its Diagnosis and Treatment."

Tri-County Meeting.—The medical societies of Knox, Warren and Henry counties will meet in Galesburg, November 13, to hear the following Chicago physicians:

Dr. Howard L. Alt, The Common Blood Diseases Seen in General Practice.
Dr. Ralph A. Reis, Office Gynecology.
Dr. Francis L. Lederer, Clinical Significance of Hoarseness (motion pictures in kodachrome of the various laryngeal conditions causing hoarseness).
Dr. Geza de Takats, Peripheral Vascular Disease.

Southern Illinois Medical Association.—The sixty-seventh annual meeting of the Southern Illinois Medical Association will be held in Murphysboro, November 6. The program has been designed to interest the general practitioner. The speakers will be:

Dr. Frank M. Keiser, Murphysboro, Spinal Anesthesia.
Dr. Willard C. Scrivner, East St. Louis, Importance of Prenatal Care.
Dr. Gilbert H. Edwards, Pinckneyville, Postpartum Care of Mother Including Early Care of Infant.
Dr. Andy Hall Jr., St. Louis, Urologic Problems of the General Practitioner.
Dr. Frederick V. Emmert, St. Louis, Management of Difficult Labor by the General Practitioner.
Dr. Ralph A. Kinsella, St. Louis, Medical Management of Nephritis.
Mr. Josiah Whitnel, attorney at law, East St. Louis, Medicolegal Problems of the General Practitioner.
Dr. James J. Donahue, East St. Louis, Pediatrics in General Practice.
Dr. Everett P. Coleman, Canton, Diagnosis of Obscure Abdominal Conditions.
Dr. James H. Hutton, Chicago, Endocrine Therapy Including That of the Menopause.
Dr. Frederick A. Jostes, St. Louis, Low Back Pain.
Dr. Carl G. Morlock, Rochester, Minn., Problem of the Small Ulcerating Gastric Lesion.
Dr. Roy H. Milligan, St. Louis, Acute Otitis Media.
Dr. Charles H. Phifer, Chicago, Vascular Accidents in Abdominal Surgery.

At the banquet the speakers will include Drs. Charles O. Lane, West Frankfort, president of the Southern Illinois Medical Association; James S. Templeton, Pinckneyville, past president of the state society, and Andy Hall, Mount Vernon.

Chicago

Dr. Koch Made Professor Emeritus.—Fred C. Koch, Ph.D., Frank P. Hixon distinguished service professor and chairman of the department of biochemistry of the University of Chicago, retired October 1 with the title emeritus, having reached the retirement age of 65. Dr. Koch received his Ph.D. degree at Chicago in 1912 and in the same year became instructor of physiologic chemistry there. He subsequently served as associate professor, professor of biochemistry and chairman of the department. He is an Associate Fellow of the American Medical Association and a member of the Institute of Medicine of Chicago and in 1937 was president of the Association for the Study of Internal Secretions. In 1926 he was secretary of the Society of Biological Chemists. Dr. Koch's research has dealt largely with study of hormones.

Society News.—Drs. Virgil P. W. Sydenstricker, Augusta, Ga., and Walter E. Dandy, Baltimore, discussed "Vitamin Deficiencies" and "Diagnosis and Treatment of Lesions of the Cranium," respectively, before the North Side Branch of the Chicago Medical Society, October 16.—The Chicago Gynecological Society was addressed, October 17, by Drs. James H. Beaton, Grand Rapids, Mich., and David S. Hillis on "Influence of an Antispasmodic Drug upon the Cervix in Labor" and Solomon J. Benensohn, "Pregnancy in Syphilitic Mothers at the Cook County Hospital (935 Pregnancies)."—At a meeting of the Robert Sonnenschein Study Group for Medical History in Michael Reese Hospital, October 15, Drs. Frederick Stenn spoke on "Milk Sickness"; Herbert Ratner, "Historical Aspects of Baldness," and Benjamin B. Beeson, "Georges Clemenceau the Physician."

IOWA

Postgraduate Programs.—In the series of postgraduate programs conducted by the Polk County Medical Society, Des Moines, Dr. William P. Murphy, Boston, will speak, November 12, on "The Treatment of Anemia." Members of the society will present this program on December 17:

Dr. Richard F. Birge, Newer Laboratory Methods.
Dr. Lee F. Hill, Idiopathic Hypoparathyroid Tetany—Calcium Metabolism.
Dr. John Russell, The Tuberculosis Problem.
Dr. Frank W. Fordyce, Surgical Treatment of Pulmonary Tuberculosis.

KENTUCKY

Changes in Health Officers.—Dr. James H. Wells, Hickman, health officer of Fulton and Hickman counties, has been appointed health officer of Bell County to succeed Dr. Adam Stacy Jr., Pineville, who resigned to enter private practice. Dr. Layson B. Swann, Clinton, has been appointed head of the Fulton-Hickman counties unit.

Society News.—Drs. Joseph Andrew Bowen and Jacob S. Bumgardner, Louisville, addressed the Jefferson County Medical Society, Louisville, October 20, on "Urology in Infancy and Childhood" and "Common Lesions of the Larynx" respectively.—Drs. James W. Bruce and Morris Flexner, Louisville, addressed the Bourbon County Medical Society, Paris, September 25, on "Acute Rheumatic Fever."—Dr. Chauncey W. Dowden, Louisville, addressed the Louisville Medico-Chirurgical Society, October 24, on "An Evaluation of the Present Knowledge of Vitamin B."

MICHIGAN

Sixteenth Annual Clinic.—The Highland Park Physicians' Club held its sixteenth annual clinic on October 29. Mayor Blaine T. Colman opened the program with an address of welcome. Dr. Plinn F. Morse, Detroit, was chairman of a round table discussion on "Postoperative Complications," which was participated in by Drs. Geza de Takats, Chicago; Reed M. Nesbit, Ann Arbor; Ivan B. Taylor, Detroit; Arthur E. Hammond, Detroit, and Fredrick F. Yonkman, Detroit. In the afternoon the program was presented by the following:

Dr. de Takats, Vascular Emergencies of the Extremities.
Dr. Frederick H. Falls, Chicago, The Falls Test and Various Other Tests for Pregnancy.
Dr. John A. Toomey, Cleveland, Infantile Paralysis.
Dr. Carl E. Badgley, Ann Arbor, Immediate Treatment of the Common Fractures.

Dr. Vaughan Named Dean of Public Health School.—Henry F. Vaughan, Dr.P.H., professor of public health at the University of Michigan Medical School, Ann Arbor, has been appointed dean of the new School of Public Health at the university and chairman of the department of public health practice. Under the new setup, Drs. Thomas Francis Jr. and Lowell T. Coggeshall of the Rockefeller Foundation, New York, will be professor and chairman of the department of epidemiology and professor of epidemiology, respectively. Dr. John Sundwall, former professor and director of the division of hygiene and public health, has been named professor of hygiene and public health. Other transfers into the new unit include:

Nathan Sinai, Dr.P.H., professor of public health.
Dr. Emory W. Sink, assistant professor of public health.
Kenneth A. Easlick, D.D.S., assistant professor of public health dentistry.
Marguerite F. Hall, Ph.D., assistant professor of biometrics.
Lloyd R. Gates, Dr.P.H., instructor in public health engineering.
Dr. Lavinia G. MacKaye, instructor in child health.
Dr. David A. VanderSlie, instructor in school health.

The new School of Public Health has been made possible by two gifts of \$500,000 each by the W. K. Kellogg Foundation and the Rockefeller Foundation. Half the total will be applied to the cost of the site, building and equipment and the other half to maintenance over a ten year period.

MINNESOTA

Mayo Lectures on Civilian and Military Practice.—The Mayo Foundation for Medical Education and Research, Rochester, announces that a series of lectures, demonstrations and clinics by members of the faculty and invited guests will be held during the week of November 10. Problems related to medical and surgical emergencies encountered in civilian and military practice will be emphasized. Physicians are invited to attend.

Society News.—Dr. Warfield M. Firor, Baltimore, discussed "Tetanus: Experimental and Clinical Study" in a Mayo Foundation lecture at the Mayo Clinic, Rochester, October 9. Ernest O. Lawrence, Ph.D., professor of physics, University of California, Berkeley, delivered a Mayo Foundation lecture October 8 on "Artificial Radio-Activity and the Cyclotron in Medicine."—Dr. Maurice B. Visscher, Minneapolis, considered "Problems in Aviation Medicine" in his thesis before the Minnesota Academy of Medicine, St. Paul, October 8.—Dr. Charles E. Connor, St. Paul, discussed "Present Status of the Surgery of the Nasal Accessory Sinuses" before the Ramsey County Medical Society in St. Paul, September 29, and Dr. John J. Hochfilzer, St. Paul, "Nasal Sinuses as Foci of Infection."

MISSOURI

Lecture on Cancer Research.—Dr. James B. Murphy, New York, will deliver the third Barnard Hospital Lecture, sponsored by the Barnard Free Skin and Cancer Hospital, St. Louis, before the St. Louis Medical Society, St. Louis, November 18. His subject will be "An Analysis of the Trends in Cancer Research."

NEW YORK

Lectures for Sullivan County Society.—The council committee on public health and education of the Medical Society of the State of New York arranged the following series of lectures for the Sullivan County Medical Society:

Dr. Paul W. Beaven, Rochester, Deficiency Diseases of Children, October 15, in Monticello.
Dr. Marjorie F. Murray, Cooperstown, Physical Examination of Children, October 22, in Liberty.
Dr. Charles Hendee Smith, New York, Diet in Infancy and Childhood, October 29, in Woodbourne.
Dr. Albert D. Kaiser, Rochester, Rheumatic Fever and Heart Disease, November 5, in Liberty.
Dr. Francis J. Carr Jr., New Rochelle, Poliomyelitis—Practical Suggestions in the Treatment and Care of a Poliomyelitis Case, November 12, in Monticello.
Dr. Carr, The New York State Program for the Rehabilitation of Handicapped Children, November 19, in Liberty.
Dr. Abraham Clement Silverman, Syracuse, Infectious Diseases of Childhood, November 26, in Liberty.

Tuberculosis Case-Finding Study.—The South Brooklyn Medical Society, in cooperation with the Medical Society of the County of Kings, the Academy of Medicine of Brooklyn and the Brooklyn Tuberculosis and Health Association, on December 1 will begin a case-finding study for tuberculosis among the patients of private physicians practicing in the Red Hook-Gowanus Health District. The survey will run for a six months' period. A general meeting will be held November 6 to discuss "The Medical Profession's Job as Viewed by the Health Department," "Diagnosis Measures Which the Medical Profession Can Employ," "Differential Diagnosis of Pulmonary Tuberculosis from Other Forms of Chest Pathology" and "A Challenge to the Medical Profession." A four day course on tuberculosis, open to all physicians cooperating in the survey, will be held at the Red Hook-Gowanus Health Center, November 12-19.

Postgraduate Institute at Rochester.—The University of Rochester School of Medicine and Dentistry and the Medical Society of the County of Monroe, in cooperation with the Medical Society of the State of New York, will conduct a postgraduate institute in Rochester November 11-13. The institute takes the place this year of the annual postgraduate course of the Monroe County Medical Society and the annual postgraduate conference of the state medical society. The program will include a forum on "Laboratory Methods in Clinical Medicine," conducted by Dr. Russell L. Haden, Cleveland. Dr. Howard W. Haggard, New Haven, Conn., will address a special session of the county medical society the first evening on "Johannes Müller and the Modern Conception of Cancer." The second evening Dr. John A. Toomey, Cleveland, will present the Monroe County Medical Society Lecture on "Poliomyelitis." The Eastman Memorial Lecture will be delivered Thursday evening by Dr. Edward William Alton Ochsner, New Orleans, on "Treatment of Intravenous Clotting." Participants in a question box period Wednesday afternoon will be Drs. John Murray Steele and Hugh Auchincloss, both of New York, and Dr. Ochsner and Dr. Toomey. The program also includes discussions on endocrine disorders, infectious diseases, problems in the treatment of adult tuberculosis, peripheral arterial disease and a symposium on the newborn period, offered by the American Academy of Pediatrics in cooperation with the Rochester Pediatric Society.

New York City

Clinic to Help Voiceless Patients.—The National Hospital for Speech Disorders, 61 Irving Place, has opened a clinic to rehabilitate patients who have become voiceless through loss of the larynx. Treatment aims to develop a substitute voice, and at the same time social aid is given the patient to help him become readjusted to his surroundings.

Dr. Whipple Awarded Bigelow Medal.—Dr. Allen O. Whipple, Valentine Mott professor of surgery, Columbia University College of Physicians and Surgeons, will be presented with the Bigelow Medal by Dr. David Cheever, Boston, on behalf of the Boston Surgical Society at a special meeting in Boston, November 7, for his contributions to the advancement of surgery. Dr. Irving J. Walker, president of the society, will introduce Dr. Whipple, whose address will be entitled "Present Day Surgery of the Pancreas."

Society News.—At a meeting of the New York Society for Clinical Ophthalmology, October 6, the speakers were Drs. George I. Swetlow, Brooklyn, on "The Physician in Court"; Morris Davidson, "The Ophthalmologist as an Expert Witness in Compensation Cases," and Percy Fridenberg, "Some Medical Aspects of Ophthalmology."—Drs. Frederick H. Amendola and Harold Neuhoof addressed the New York Surgical Society, October 8, on "Repair of Hernia with Silk-Binding Stitch" and "An Operative Procedure for Inguinal

Hernia Based on Buttrressing the Undefined Space respectively.—Dr. William P. Murphy, Boston, addressed the Medical Society of the County of Kings, October 21, on "Chronic Leukemia" and "Esophageal Hiatus Hernia (an unpublished paper)."

Public Lectures.—The Brooklyn Institute of Arts and Sciences, the Medical Society of the County of Kings and the Academy of Medicine of Brooklyn are cooperating in a series of "Lectures to the Laity." The series opened October 28 with Dr. Howard W. Haggard, director of the laboratory of applied physiology, Yale University, New Haven, discussing "Devils, Drugs and Doctors." Other lecturers will be:

Dr. Thomas A. Gonzales, chief medical examiner, Relation of Medicine to Crime Detection, November 25.

Dr. Foster Kennedy, professor of clinical medicine (neurology), Cornell University Medical College, What and Why Is Your Mind, January 27.

Dr. George Draper, associate professor of clinical medicine, Columbia University College of Physicians and Surgeons, The Man Within the Patient, February 24.

Dr. Walter C. Alvarez, senior consultant in medicine, Mayo Clinic, Rochester, Minn., Food, Faith and Civilization, March 24.

OHIO

Medical Institute in Toledo.—Round table discussion by members of the staff of the department of physiology of Cornell University Medical College, New York, made up the program of the Medical Institute of the University of Toledo in the university's auditorium, Toledo, October 31. The speakers were Drs. McKen Cattell, associate professor of pharmacology, Eugene F. Du Bois, professor of physiology, and Harry Gold, assistant professor of pharmacology. Topics discussed include "Digitalis: New Light on an Old Drug," "Management of Heart Failure" and "Circulatory Stimulants and Shock."

Personal.—Dr. Hans P. Lee, assistant physician at the Toledo State Hospital for twelve years, has been named superintendent of the Cleveland State Hospital.—Dr. Mortimer Herzberg was recently guest of honor at a dinner given by members of the staff of Jewish Hospital, Cincinnati, to mark his retirement as head of the clinical laboratory after eighteen years' service.—Dr. Mary A. Graber, Columbus, has been appointed chairman of the Franklin County Council on Nutrition for National Defense.—Dr. Donald D. Shira, for four years assistant secretary and medical adviser of the Ohio Public Health Association and associate editor of *Ohio Public Health*, has resigned to return to private practice in La Rue. He will continue as medical editor of *Ohio Public Health*.—Major Claude S. Perry, Medical Reserve Corps, U. S. Army, Columbus, has been designated as state reemployment officer in charge of directing efforts of local draft boards in obtaining employment for draftees who have been released from military service. He will continue with his work as assistant chief medical officer of Selective Service for Ohio.—Dr. John A. Carter, Batavia, health officer of Clermont County since 1936, has been appointed health officer of Middletown to succeed the late Dr. George D. Lummis.—Three psychiatrists were recently appointed to the Cleveland-Cuyahoga County psychiatric clinic; they are Drs. Arthur A. Roth, Cleveland Heights; Wilfred M. Gill, Lakewood, and Harry A. Lipson, Cleveland Heights.

PENNSYLVANIA

Society News.—Dr. Emil Novak, Baltimore, addressed the Cambria County Medical Society, Johnstown, October 9, on "Clinical Use of the Female Sex Hormone."—Dr. Joseph H. Barach, Pittsburgh, discussed "Diabetes as a Scientifically Treated Disease" before the Crawford County Medical Society at Meadville, October 15.—The Lackawanna County Medical Society was addressed in Scranton, October 28, by Dr. John L. Kantor, New York, on "Affections of the Small Intestine and Colon as Seen by the General Practitioner."—Harold Westlake, Ph.D., discussed "Cause and Treatment of Speech Defects" before the Centre County Medical Society in Bellefonte, October 16. Dr. Westlake is supervisor of speech correction in the Pennsylvania State Department of Public Instruction, Harrisburg.

Philadelphia

Society Studies Health of Its Members.—The Philadelphia County Medical Society has announced the establishment of a committee for the preservation of the health of physicians to make a five year study of the physical and mental history of 1,000 local physicians, newspapers report. The group to be studied will be taken from the membership of the society.

Society News.—Dr. Francis C. Grant delivered the annual oration of the Philadelphia Academy of Surgery, October 13, on "Brain Abscess."—Dr. Hans G. Schlumberger, among others, addressed the Pathological Society of Philadelphia, October 9, on "Rudolf Virchow—Revolutionist."—The Philadelphia Neurological Society was addressed by Drs. Joseph Stokes Jr. and Pascal F. Lucchesi, October 24, on the epidemiology of poliomyelitis and "Character of the Poliomyelitis of 1940-1941," respectively.

WASHINGTON

State Medical Election.—Dr. Albert P. Duryee, Everett, was named president-elect of the Washington State Medical Society at its recent annual meeting in Seattle and Dr. George W. Cornett, Yakima, was installed as president. Dr. Herbert E. Coe, Seattle, is vice president of the society. The annual meeting for 1942 will be held in Spokane.

Survey of Poliomyelitis.—The George Williams Hooper Foundation of the University of California Medical School, San Francisco, recently conducted a survey of poliomyelitis and encephalitis in Yakima and surrounding territory, under the supervision of Dr. William D. Hammon. The viruses of St. Louis encephalitis and western equine encephalomyelitis were isolated from mosquitoes and by neutralization tests of more than 400 mammals and birds; extensive domestic reservoirs were found, according to a report from the university. Several members of the staff of the foundation working on the survey returned to the university September 17.

GENERAL

Sedgwick Medal Awarded to Dr. Armstrong.—The American Public Health Association at its recent annual meeting in Atlantic City, N. J., awarded the gold Sedgwick Memorial Medal "for distinguished service in public health" to Dr. Charles Armstrong, senior surgeon, U. S. Public Health Service, and investigator at the National Institute of Health, Bethesda, Md. Dr. Armstrong graduated at Johns Hopkins University School of Medicine, Baltimore, in 1915, joining the public health service the following year. Dr. Armstrong is credited with basic work in research of the transmission of sleeping sickness, psittacosis and infantile paralysis.

Changes in Status of Licensure.—The District of Columbia Commission on Licensure reports the following:

Dr. George J. Allen, Washington, license revoked, June 6, for his conviction of violation of the Harrison Narcotic Act.

The Minnesota State Board of Medical Examiners reports the following:

Dr. Harry A. Miller, Fairmont, license suspended for three years, July 11, having been found guilty of performing an abortion.

The Vermont State Board of Registration in Medicine announces the following:

Dr. Maximilian L. Herzog, New York, license revoked, June 17, because of lack of satisfactory evidence that he had completed a four year resident medical course in an approved medical school, as required under the Vermont Medical Practice Act. The Vermont license was granted on endorsement of Nevada credentials.

Central Society for Clinical Research.—The fourteenth annual meeting of the Central Society for Clinical Research will be held at the Drake Hotel, Chicago, November 7-8, under the presidency of Dr. Lawrence D. Thompson, St. Louis. Included among the speakers will be:

Dr. Josef Warkany and Rose Nelson, Ph.D., Cincinnati, Ohio, Congenital Malformations on a Nutritional Basis in Rats.

Dr. Edgar S. Gordon, Madison, Wis., The Therapeutic Use of a Synthetic Estrogen.

Drs. Arthur W. Frisch and Alvin E. Price, Detroit, Sputum Studies in Pneumonia: The Selection of Therapy.

Drs. William C. Buchbinder and Frank Neuwelt, Chicago, The Localization of Human Bundle Branch Block.

Dr. Elmer L. Sevringhaus, Madison, Wis., Treatment of Parathyroid Tetany.

Dr. William C. Beck, Chicago, Studies of the Appendiceal Fecalith.

Dr. George E. Wakertin, Clarence A. Johnson, Ph.D., Dr. Bernard Gomberg, Edwin L. Smith, M.S., and George A. Olander Jr., Chicago, Treatment of Experimental Renal Hypertension with Renin.

Dr. Nathan S. Davis III, Chicago, Chronic Sub-Nutrition and Essential Hypertension.

College of Surgeons Meeting.—The thirty-first annual Clinical Congress of the American College of Surgeons will be held at the Statler and Copley-Plaza hotels, Boston, November 3-7. Dr. Evarts A. Graham, St. Louis, will deliver his address as retiring president Monday evening on "American Surgery in a Changing World," and Dr. William Edward Gallie, Toronto, the incoming president, will present the annual oration on surgery Tuesday evening on "Lessons Learned in the Great War." Dr. Walter Estell Lee, Philadelphia, will give the oration on fractures and other traumas Wednesday evening. A new feature this year will be a "Forum on Fundamental Surgical Problems," formulated by a committee under the chairmanship of Dr. Owen H. Wangensteen, Minneapolis.

and designed for younger men, representing various university departments, to present important results of their clinical and experimental research. The general program includes symposiums, panel discussions, clinics and clinical pathologic conferences.

Grant for Study of Private Health Agencies—A three year comprehensive study of the activities of all private health agencies is to be undertaken by the National Health Council, under a special grant of \$75,000 from the Rockefeller Foundation. The report of the survey will attempt to answer such broad questions as: What are the various types of state and local voluntary health agencies? What fields do they cover? What methods of cooperation with official health agencies have they established? What do they cost to operate? What types of health work lead to the greatest active participation on the part of the citizens? Selskar M. Gunn, C.P.H., vice president of the Rockefeller Foundation, will direct the study at the request of the National Health Council, which was established by the foundation in 1921. Mr. Gunn returned to America recently after a long stay abroad as director of the European headquarters of the Rockefeller Foundation in Paris, now closed because of the war. Previously he had been in charge of the foundation's program of rural reconstruction in China.

Conference on Industrial Health—The second American Conference on Industrial Health will be held at the Chicago Towers Club, Chicago, November 5-6. Sessions will be devoted to the technical problems of industrial health, the economics of industrial health, the social implications of industrial health and defense activities and industrial health. One luncheon meeting will cover "Health Service in Small Groups", the second, "The Problem of Women in Industry". The dinner session will consider "Industrial Health, Defense and the Private Practitioner". Speakers at the various sessions will include:

Dr. Morris Fishbein, Editor of THE JOURNAL, Chicago.
Mr. Harold F. North, head of the industrial relations department of Swift & Company, Chicago.
Mr. Terence F. Cunneen, executive assistant for insurance, U. S. Chamber of Commerce, Washington, D. C.
Mr. Verne Zimmer, director, division of labor standards, U. S. Department of Labor, Washington, D. C.
Dr. Fred J. Wampler, professor of preventive medicine, Medical College of Virginia, Richmond.
Mr. T. A. Virkus, president of the Illinois Division of National Small Business Men's Association, Chicago.
Col. Donald Armstrong, executive officer, Ordnance Department, U. S. Army, Chicago.
Dr. Walter Clarke, executive director, the American Social Hygiene Association, New York.

The American Conference on Industrial Health aims to raise the standards of health for the employed population. The American Conference on Industrial Health was incorporated, not for profit, under the laws of Illinois in 1940.

Interns from Latin America—Thirty seven interns representing fifteen nations of South, Central and Caribbean America recently arrived in the United States to spend a year in United States hospitals and medical schools. The interns have received fellowships for study in this country through the cooperation of the Office of the Coordinator of Inter-American Affairs, the Pan American Sanitary Bureau and the participating institutions. The committee of sponsors for the plan under which these interns are studying is composed of the following:

Dr. Walter W. Palmer, Bard professor of medicine, Allen O. Whipple, Valentine Mott professor of surgery, Rustin McIntosh, professor of pediatrics, Columbia University College of Physicians and Surgeons, New York.
Dr. William S. Ladd, dean and professor of clinical medicine, Cornell University Medical College, New York.
Dr. Currier McEwen, dean and associate professor of medicine, New York University College of Medicine, New York.
Dr. William S. McCann, Charles A. Dewey professor of medicine, University of Rochester School of Medicine and Dentistry, Rochester, N. Y.
Dr. Oswald H. Robertson, professor of medicine, University of Chicago School of Medicine.
Dr. L. Whittington Gorham, professor of medicine and director of the department, Albany Medical College, Albany, N. Y.
Dr. William J. Kerr, professor of medicine, University of California Medical School, San Francisco.
Dr. Francis G. Blake, dean, Yale University School of Medicine, New Haven, Conn.
Dr. William D. Cutter, Secretary, Council on Medical Education and Hospitals, American Medical Association, Chicago.
Dr. Marion A. Blankenhorn, Gordon and Helen Hughes Taylor professor of medicine, University of Cincinnati College of Medicine.
Dr. Herman G. Weiskotten, dean, Syracuse University College of Medicine, Syracuse, N. Y.
Dr. George M. McKenzie, chief of staff of the Mary Imogene Bassett Hospital, Cooperstown, N. Y.

Southern Medical Association—The thirty-fifth annual meeting of the Southern Medical Association will be held in St. Louis, November 10-13, with headquarters at the Jefferson Hotel. The St. Louis Medical Society will act as host. A public session Monday evening will be addressed by Dr. James

S. McLester, Birmingham, Ala., former President of the American Medical Association, on "Nutrition in War Time." Mr. Edward A. Tamm, assistant director, Federal Bureau of Investigation, U. S. Department of Justice, Washington, D. C., "Espionage in the United States," and Dr. Frank H. Lahey, Boston, President of the American Medical Association, "Position of Medicine Today." Tuesday evening has been designated "President's Night", speakers at this meeting will include Rev. Alphonse M. Schwitala, S. J., St. Louis, who will give the invocation, and Dr. Paul H. Ringer, Asheville, N. C., president of the association, who will deliver an address entitled "Giants of Yesterday." Among the speakers will be:

Drs. Philip W. Brown, Louis A. Buie and Harry M. Weber, Rochester, Minn., An Unclassified Type of Ulcerative Disease of the Colon.
Dr. Nolan D. C. Lewis, New York, Biopsychiatry or Natural History of Psychiatry.
Dr. Martin H. Fischer, Cincinnati, Nature and Cause of Edema.
Dr. William Walters, Rochester, Adrenal Tumors.
Dr. Lewis Clark Wagner, New York, Cysts of the Semilunar Cartilages. A Study of 40 Cases.
Drs. Ralph E. Campbell, Madison Wis. and John L. McKelvey, Minneapolis, Chemotherapy in Obstetrics and Gynecology.
Dr. Oswald S. Lowsley, New York, Plastic Operations in Urology.
Dr. Louis J. Hirschman, Detroit, Some Pitfalls in Proctologic Diagnosis.
Dr. George P. Myers, Detroit, Hypertension in Train and Engine Service.
Drs. Ralph M. Tovell and Richard E. Edmondson, Hartford, Conn., Modern Concepts of Cyclopropane Anesthesia.
Dr. William H. Perkins, Philadelphia, Present Status of Teaching Preventive Medicine and Public Health in Our Medical Schools.

Drs. Cecil S. O'Brien, Iowa City, and Ernest M. Seydell, Wichita, Kan., will hold a round table discussion on "Staphylococcus Keratoconjunctivitis" and "Acute Otitis Media and Mastoiditis," respectively.

Deaths in Other Countries

Herbert Ritchie Spencer, consulting obstetric physician, University College Hospital, London, emeritus professor of obstetric medicine, University College, London, formerly president of Section of the History of Medicine and of Section of Obstetrics and Gynecology, Royal Society of Medicine, formerly president of the Medical Society of London, Harveian Orator in 1921, died August 28.—Dr. Adalbert Czerny, for many years professor of pediatrics at the University of Berlin, died, October 4, in Berlin, aged 78, according to a dispatch in the New York Times.—Dr. L. C. Baillieu, chief surgeon at the American Hospital of Paris since the death of Dr. Thierry de Martel at the time of the German occupation of Paris in June 1940, recently died in Paris, the Times reported September 26.

Government Services

Public Health Service Districts Reorganized

The U. S. Public Health Service districts, into which the United States and its territories are divided, have been reorganized so that there are now eight districts instead of six. The new districts and their directors are:

DISTRICT 1

Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont. Medical Director: Claude C. Pierce, Sub-Treasury Building, 15 Pine Street, New York.

DISTRICT 2

District of Columbia, Maryland, North Carolina, Virginia, West Virginia. Senior Surg. Mark V. Ziegler, 25th & E Street N. W., Washington, D. C.

DISTRICT 3

Illinois, Indiana, Kentucky, Michigan, Ohio, Wisconsin. Medical Director: Lon O. Weldon, Room 855, New Custom House, Chicago.

DISTRICT 4

Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, Tennessee. Medical Director: Charles L. Williams, 210 State Street, New Orleans.

SUPPLEMENTAL DISTRICT 4

New Mexico, Texas. Dr. Knox E. Miller, San Antonio.

DISTRICT 5

California, Nevada, Oregon, Washington, Alaska, Hawaii. Medical Director: Richard H. Creel, Room 112, Federal Office Building, San Francisco.

DISTRICT 6

Puerto Rico, Virgin Islands. Senior Surg. Thomas H. D. Griffiths, San Juan, P. R.

DISTRICT 7

Arkansas, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota. Senior Surg. Calvin C. Applewhite, Room 601, 112 Business Men's Assurance Company Building, 215 West Pershing Road, Kansas City, Mo.

DISTRICT 8

Arizona, Colorado, Idaho, Montana, Utah, Wyoming. Senior Surg. Irving A. Fullerton, District Director, Room 417, 222 Clark Building, Denver, Colo.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 6, 1941.

The Bombing on London University

Much of the report on the work of the University of London during the year 1940-1941 by the principal, Mr. H. L. Eason, deals with the effects of the war on its academic life, teaching and research and on the buildings of the university. The intensive air raids on London have fully justified the policy of dispersal generally adopted in the summer of 1939. The damage to the university buildings has been so severe and widespread that if the schools had been able to continue their work in London the work of the university would have practically come to an end for the time being. But the constituent schools, which include those of the great hospitals, have also been severely damaged. University College has suffered very badly, and more recently the London School of Hygiene. The hospitals attached to the medical schools of the university have almost without exception been severely damaged. The greatest sufferers have been St. Bartholomew's and the London School of Medicine for Women. But in spite of the handicaps of war damage, decentralization and delays and difficulties of communication, the work of the university has been well maintained and normal examinations have been held, though in some cases in provincial centers where the hospitality of their universities and colleges has been extended to the University of London. The principal concludes: "This report deals in a scattered way with a scattered university. While exile has its disadvantages both for staff and students, it has its advantages in stimulating adaptability to circumstances and in providing education in methods, habits and customs of universities other than one's own. Our students and teachers have certainly not sat down by the waters of Babylon and wept." Such is the effect of the destruction wrought by the blitzkrieg on the highest activities of our civilization. The calculation was that the indiscriminate raining of thousands of tons of high explosive and incendiary bombs on the metropolis would break our spirit of resistance; it has only shown our powers of adaptation.

The Emergency Medical Services

The Emergency Medical Services have been established by the Ministry of Health to deal with the civilian casualties of the war. They have their own hospitals, medical centers and medical staffs, which include many of the leaders of the profession. Consultant advisers have been appointed to advise on the arrangements necessary to provide efficient treatment for different types of cases in emergency hospitals. Because of the dangers due to the bombing of London, much of the ministry's work has been decentralized and is carried out in regional offices. Eminent physicians and surgeons resident in the various regions have been selected to advise on the arrangements necessary for the efficient treatment of patients in the locality. In some cases the advisers appointed are consultants to the fighting forces stationed in the region. These include advisers on such special subjects as orthopedic surgery, chest wounds and head injuries. Twenty orthopedic centers are available for the treatment of orthopedic cases. For the treatment of injuries of the spinal cord and cauda equina, there is one special center in London and there are three in the provinces. There is even a special center for the diagnosis and treatment of patients presenting the effort syndrome. Ten regional consultants in thoracic surgery have been appointed and eleven in neurosurgery. For faciomaxillary injuries there are ten special centers. Mobile surgical teams have been organ-

ized to go to the assistance of hospitals other than their own in times of emergency. Some of these are special teams based on the appropriate special centers. The disposal of special head, chest and maxillofacial teams in an emergency is a matter for the respective consultant advisers to decide, and they may distribute the teams as they think best to meet the needs as they arise. The war organization of the British Red Cross and the Order of St. John of Jerusalem have undertaken to administer a number of auxiliary hospitals or convalescent homes as part of the Emergency Hospital Scheme. They are for the most part in private houses which are suitable only for postoperative, convalescent or other cases of comparatively mild involvement.

Venereal Diseases and the War

The record of previous wars has caused anxiety as to an increase of venereal diseases. At the Medical Society for the Study of Venereal Diseases Col. L. W. Harrison devoted his presidential address to a review of the present situation. He was able to state that since the outbreak of war the venereal diseases have not increased to anything like the extent feared. In 1939 the number of cases of early syphilis dealt with at the civilian treatment centers in England and Wales was 4,986, a decrease of 45 per cent since 1931 and less than a third of the number in 1920. The decline of the incidence of syphilis is also shown by a fall in the death rate due to the disease in infants from 2.03 per thousand in 1917 to 0.2 in 1939. The admission rate for syphilis in the navy stationed at home has fallen from 8.1 per thousand in 1921 to 1.96 in 1936, the last year for which figures are available. In the army the syphilis rate has fallen from 9.8 per thousand in 1921 to 0.9 in 1937. The returns from civilian clinics show that since the outbreak of war up to the end of March 1940 the fall in the syphilis rate slowed down, and that during the last twelve months there has been a definite increase in both males and females. Civilian cases of gonorrhea are fewer, but when service cases are added there is an increase of 9 to 10 per cent in males.

In the discussion which followed, the speakers maintained that there is only a slight increase in venereal diseases, except in the ports frequented by foreign seamen. In the army stationed at home the incidence has been uniform from week to week. The total rate for venereal diseases has fallen from 11.3 per thousand in 1938 to 8.7 in 1940 and 8.4 in the first five months of 1941. In the navy the return of syphilis is the lowest on record. There are now a large number of uniformed women in the auxiliary service of the navy and army. The amount of venereal disease among them is negligible.

Medical Libraries and the War

The war had a detrimental effect on medical libraries. The London ones have removed their more valuable contents to places which are safer from bombs but less accessible to readers. The Royal College of Surgeons, which has suffered much damage from bombs, took the precaution of removing a large part of its library to a place of safety which is too far away for readers. The Royal College of Physicians has had to store its library beyond access. The Royal Society of Medicine has evacuated about a third of its books within accessible reach of London. The London School of Hygiene has combined evacuation with limited accessibility. Another evil due to the war is that the medical libraries so much used for the reading of foreign periodicals are now almost devoid of them. Since the collapse of France periodicals have not been received from the countries overrun by the Germans, and very few are received from Germany. Thanks to the financial help of the Rockefeller Foundation, the Association of Special Libraries has undertaken a survey of the technical periodicals now reaching this country from abroad, so that those which are received will be available where they are most needed.

The Health of Children Improved by Migration to the Country

The anticipated bombing of our cities produced the great migration that began on Sept 2, 1939, two days before the declaration of war. It involved the transfer to safer areas of 1,500,000 persons of whom half were children. By Christmas most of the evacuated children were receiving full time education in the reception areas. Then came the reaction, because of the lack of immediate danger, and many children returned home. But the fall of France and the intensification of air attacks stimulated fresh evacuation, and by December 1940 the number of children in reception areas, which had fallen to 472,000, rose to more than 620,000. The city children sent to country districts and allowed to settle down readily adapted themselves to the ways of their hosts and the conditions of rural life. Practically all improved in physique, general health, poise and bearing. Pure air, wholesome food and longer hours of sleep brought increase in weight and height, rosier cheeks and greater physical strength.

Health of Troops in the Middle East

In spite of a trying summer, the health of the troops in the Middle East is extremely good, according to the senior British medical officer. Not only is there a lower incidence than ever before of those diseases which are most common in mass formations of men in hot climates—dysentery, malaria, enteric fevers and cutaneous diseases—but men fresh from temperate climates, such as that of England, are standing up well to the heat. This satisfactory result has been obtained mainly by educating the troops by means of propaganda and by preventive measures. A vigorous anti-fly campaign has destroyed millions of flies and their breeding grounds. This has helped to keep down dysentery. Malaria cases have dropped from 3.5 per thousand to 0.58, and typhoid from 1.89 to 0.07. There has been no typhus fever.

RIO DE JANEIRO

(From Our Regular Correspondent)

Aug 16, 1941

Some Aspects of Syphilis in Rio de Janeiro

Syphilis is highly prevalent in Brazil, and Rio de Janeiro, the capital and largest city of the country, is no exception to the rule. At the start of the present century the crude annual death rate in Rio de Janeiro from the cause certified only as "syphilis" was about 10 per hundred thousand of population. A few years later this rate began to increase slowly to 12 to 15 and then to 20. The last mentioned figure corresponds to the epoch of the first world war, when syphilis had commenced to be a common subject of discussion, and the first plans to attack the disease in Brazil appeared in the medical periodicals and in the reports to the medical societies, particularly by the late Professors Werneck Machado and Eduardo Rabello. From then on the medical interest in the disease began to grow, and the increase of the death rate became still greater. A special division of venereal diseases was created in 1920 in the health department, and this was associated with even higher figures for the death rate from syphilis, which reached the peak of 60 deaths annually per hundred thousand in 1923. But this increase in the death rate, besides being attributable among other factors to the improvement in diagnosis, is a good example of transference of causes, as during the same period the annual crude rates for deaths related to the nervous and to the cardiovascular systems had shown a corresponding decline, from 230 to 80 per hundred thousand for the first group of causes and from 307 to 182 for the second group. Then from 1924 to the present, a reverse movement of the death rates was clearly shown by the statistical returns: syphilis with a declining trend and the nervous and cardiovascular systems with a rising trend. For the last three years the mean crude

annual death rate from syphilis has been 36. Syphilis is recognized as a great factor in fetal deaths in Rio de Janeiro. During the last thirty years the fetal mortality rate has shown a fairly constant high level of about 75 per thousand total births, which is an indication of the great prevalence of syphilis. These figures have significance in the study of the incidence of mortality from syphilis. Thus for the last three years the mean crude annual death rate for the whole population of the city has been 36 per hundred thousand, while for Brazilians alone the rate has been 41 against 17 for the foreign population. For the age group 0-4 years the rate has been 350 as against only 5 for the age group 5-14 years, 6 for the age group 15-29 years and 35 for the age group 30 years and over.

Perhaps a better picture of the situation may be had from figures regarding patients found with syphilis in the clinics, hospitals and schools among those treated by the private practitioners. In a series of 20,000 persons of both sexes examined in a great outpatient clinic—the Policlínica Geral—4,943 have been found with syphilis (24.7 per cent), among whom 746 were in the early stage of the disease. In a series of 27,657 persons of both sexes examined from 1929 to 1939 at the outpatient department of the Gaffree-Guinle Hospital, 5,631 (20.4 per cent) have been found with syphilis in different stages. Among thousands of patients treated during the latter few years in the large Santa Casa General Hospital, the number of cases of active syphilis or presenting visceral lesions caused by the disease has varied yearly from 18.2 per cent to 41.3 per cent of the total number of patients in the entire hospital. Dr Martins Pereira, a public school physician, reported a few years ago 1,463 positive (27.5 per cent) Wassermann reactions in a total of 5,328 children attended in one of the school clinics of the city. In a recent paper Dr Oscar Clark reported 653 cases of visceral and nervous lesions caused by syphilis out of 2,000 consecutive recent adult patients of both sexes of his private practice (32.7 per cent). Similarly, Dr G. Londres has found 22.6 per cent of positive serologic reactions in 1,000 consecutive male patients, among whom there were 181 in the early stage of the disease. The percentage of positive serologic reactions in pregnant women at large is considered a good index of the incidence of syphilis in the population. The figures for Denmark (Sicke), Australia (Fowler and Farley) and the United States (Stillians), for instance, are pretty close, being respectively 67, 64 and 60, the latter relating to white women alone. It is interesting therefore to know that out of the total of 3,597 pregnant women attended in 1938 at the health centers of Rio de Janeiro 7.6 per cent had a positive Wassermann reaction. The Inhumana Health Center, serving a poor district of the city, reported 11.0 per cent of positive Wassermann reactions.

Marriages

W. WILSON SCHIER, New York, to DR. MARILYN BURLINGAME of Brooklyn, at Shelter Island Heights, L. I., August 16.

NICHOLAS HOWELL HOWELS, Chillicothe, Ohio, to Miss JESSIE MAY Ullman of Waterford, Ohio, in Columbus in August.

FRANK C. WOMACK, JR., Nashville, Tenn., to Miss AGNES L. HIGHTOWER, of Nacona, Texas, September 1.

ELIYAS R. TROMER to Miss CATHERINE KIRKPATRICK, both of Greensboro, N. C. in Durham, August 20.

RAYMOND FRANKLIN SHIELLY to Miss MARGARET ELIZABETH ZINN, both of Gettysburg, Pa., August 23.

LANCELOT W. ELLER, Kanawha, Iowa, to Miss ELIZABETH HELEN MOORHEAD of Fairfield, August 15.

JOHN H. WOODBRIDGE, Tehula, Miss., to Miss THERESA PITCOCK of Portland, Ore., August 11.

MARVIN P. RHODES, New York, to Miss HELEN BRANSON STROW in Dayton, Ohio, recently.

Deaths

Howard Morrow * San Francisco, vice president of the American Medical Association 1938-1939, died from a heart attack October 22, aged 66. Dr. Morrow was born in San Francisco. He received his degree in medicine at the University of California Medical Department in 1896. Subsequently he took up the specialty of dermatology and was professor of dermatology at his alma mater from 1911 to 1940. He was also a member and past president of the American Dermatological Association. He was a member of the American Academy of Dermatology and Syphilology, of the American Radium Society, of the Dermatological Association of Great Britain and Ireland and of the Vienna Dermatological Association. Dr. Morrow was active also in the affairs of the medical profession, serving as president of the California State Board of Public Health from 1933 to 1940 and as president of the California Medical Association in 1936. He was noted particularly for his work in the field of leprosy and had been for many years consultant to the United States Public Health Service. In his death medicine in the Far West loses one of its distinguished and most respected leaders.

Rudolf Schoenheimer, New York; Friedrich-Wilhelms Universität Medizinische Fakultät, Berlin, Prussia, 1922; Fellow of the Rockefeller Foundation working at Leipzig from 1923 to 1926; examiner on pathologic physiology for the German state board in 1928; Douglas Smith Fellow, working as research associate, department of surgery, Billings Hospital, University of Chicago, 1930-1931; head, department of pathologic chemistry, Pathological Institute, University of Freiburg from 1931 to 1933; member of the American Chemical Society and the Harvey Society; in 1937 gave a Harvey Lecture; in 1941 invited by Harvard University to give the Dunham Lectures (which were delivered posthumously); aged 43; was found dead, September 11, of poison, self administered.

Edmund Andrews * Los Angeles; Rush Medical College, Chicago, 1915; member of the Illinois State Medical Society, American Surgical Association, Western Surgical Association, Society of Clinical Surgery and the Central Society for Clinical Research; fellow of the American College of Surgeons; at one time associate professor of surgery at the University of Illinois College of Medicine and professor of surgery at the University of Chicago, The School of Medicine; formerly vice president of the Chicago Academy of Sciences; served during the World War; at one time attending surgeon, Albert Merritt Billings Hospital, Chicago; aged 48; died, October 16, of coronary thrombosis.

Hans Louis Kleine * St. Louis; Washington University School of Medicine, St. Louis, 1929; major, medical reserve corps, assigned to the medical detachment of the Sixty-Third Infantry; assistant in clinical obstetrics and gynecology at his alma mater; assistant obstetrician and gynecologist, Barnes and St. Louis Maternity hospitals; assistant obstetrician and gynecologist to outpatients, University Clinics; aged 35; died, September 21, at Natchitoches, La., of injuries received when he fell from a truck during army maneuvers.

Benjamin Frank Macnaughton, Montreal, Que., Canada; McGill University Faculty of Medicine, Montreal, 1915; member of the American Academy of Ophthalmology and Otolaryngology; served with the Royal Army Medical Corps during the World War; demonstrator of otolaryngology at his alma mater; served on the staff of the Montreal General Hospital in various capacities; aged 52; died, September 17, in the Western Division of the Montreal General Hospital.

Edward W. Mercer, Miami, Fla.; Hahnemann Medical College of Philadelphia, 1884; was demonstrator of histology and pathology from 1887 to 1890, demonstrator of obstetrics from 1890 to 1897 when he was made professor of obstetrics and held this chair until 1903; was senior obstetrician to the Hahnemann Hospital; aged 82; died, September 25.

Charles De Witt Colby, Asheville, N. C.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1892; member of the Medical Society of the State of North Carolina; member of the American College of Chest Physicians; veteran of the Spanish-American War; aged 75; died, September 23, of arteriosclerosis and heart disease.

Frank Cooley Phelps * Vergennes, Vt.; University of Vermont College of Medicine, Burlington, 1893; past president of the Vermont State Medical Society; formerly mayor and city health officer; on the staffs of the Porter Memorial Hospital, Middlebury, and the Mary Fletcher Hospital, Burlington; aged 70; died, September 20.

Joseph Brown, Des Moines, Iowa; Baltimore Medical College, 1910; fellow of the American College of Surgeons; formerly on the associate staff of the Iowa Methodist, Mercy, and Iowa Lutheran hospitals and attending surgeon, Broadlawn General Hospital; aged 55; died, September 5, at Hollywood, Calif.

Frank Wesley Shipman, Mount Vernon, N. Y.; Bellevue Hospital Medical College, New York, 1893; for many years health officer of Mount Vernon; aged 71; served in various capacities on the staff of the Mount Vernon Hospital, where he died, September 20, of osteoporosis of the spine and pyonephrosis.

Allen Grant Flythe, Durant, Okla.; Jefferson Medical College of Philadelphia, 1921; member of the Oklahoma State Medical Association; assistant professor of pathology at the Baylor University College of Medicine, Dallas, Texas, 1923-1924; aged 45; died, September 21, of Rocky Mountain spotted fever.

James Ambrose Johnston, Cincinnati; Cincinnati College of Medicine and Surgery, 1881; past president of the Academy of Medicine of Cincinnati; fellow of the American College of Surgeons; formerly on the staff of St. Mary Hospital; aged 81; died, September 19, in the Christ Hospital of tuberculosis.

Alfred Winfield White, Brooklyn; Cornell University Medical College, New York, 1905; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; aged 65; on the staff of St. John's Hospital, where he died, September 9, of nephritis.

Anatole Desjardins * Wilkes-Barre, Pa.; Boston University School of Medicine, 1925; member of the Radiological Society of North America, Inc., and the American College of Radiology; on the staff of the Wilkes-Barre General Hospital; aged 48; hanged himself, September 18.

William Webster Harmer, Greeley, Colo.; Ohio Medical University, Columbus, 1900; member of the Colorado State Medical Society; past president of the Weld County Medical Society; on the staff of the Greeley Hospital; aged 69; died, August 21, of coronary thrombosis.

Philip Douglas Werum * Toledo, Ohio; Chicago College of Medicine and Surgery, 1916; served during the World War; formerly on the staffs of the Robinwood Hospital and St. Vincent's Hospital; aged 54; died, September 3, in the Mercy Hospital of carcinoma of the lung.

George Eames Berrian, Jersey City, N. J.; Columbia University College of Physicians and Surgeons, New York, 1939; member of the West Virginia State Medical Association; on the staff of the Holden Hospital; aged 25; was found dead, September 14, at Holden, W. Va.

William F. Roberts * Troy, Tenn.; University of Tennessee Medical Department, Nashville, 1894; past president and secretary of the Obion County Medical Society; formerly a bank president; aged 72; died, September 26, of pneumonia following a cerebral hemorrhage.

Ulysses Grant McElvain, Kansas City, Mo.; American Medical College, St. Louis, 1911; member of the Missouri State Medical Association; aged 71; died, September 24, in the Bethany Hospital, Kansas City, Kan., of chronic nephritis, arteriosclerosis and hypertension.

John Terrence Miller, Decatur, Ill.; Medical College of the State of South Carolina, Charleston, 1896; on the staffs of the Decatur and Macon County Hospital and the City Public Hospital; aged 69; died, September 23, in St. Mary's Hospital of lymphatic leukemia.

William George Rebec * Belmont, Calif.; University of Michigan Medical School, Ann Arbor, 1925; medical director and superintendent of the Twin Pines Sanitarium; aged 44; died, September 10, at the Mills Memorial Hospital, San Mateo, of staphylococcal septicemia.

Margaret McKellar, Toronto, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1890; for many years a medical missionary in India under the Canadian Presbyterian Mission, and later the United Church; died, August 24, in the Toronto General Hospital.

Reinhardt W. Boerner, Milwaukee; Wisconsin College of Physicians and Surgeons, Milwaukee, 1896; member of the State Medical Society of Wisconsin; on the staff of St. Joseph's Hospital; aged 67; died, September 13, in the Milwaukee Hospital of diabetes mellitus.

William Sheffield Norton, Muscatine, Iowa; Kansas Medical College, Medical Department of Washburn College, Topeka, 1900; county coroner; past president of the board of education; served during the World War; aged 74; died, September 13, of coronary occlusion.

Robert Graham ☉ Duluth, Minn.; Detroit College of Medicine, 1893; for many years county physician; at various times on the staffs of St. Luke's Hospital and St. Mary's Hospital; aged 76; died, September 22, of carcinoma of the head of the pancreas.

Austin Byron Jones ☉ Kansas City, Mo.; St. Louis University School of Medicine, 1915; fellow of the American College of Physicians; on the staffs of the Menorah, Research and Kansas City General hospitals; aged 49; died, September 3, of heart disease.

Harry Sherman Gossage, Petaluma, Calif.; Cooper Medical College, San Francisco, 1893; for many years city councilman; at one time health officer; aged 72; died, September 8, at St. Helena Sanitarium and Hospital, Sanitarium, of cerebral hemorrhage.

David O'Quinn Du Bose, Andrews, S. C.; Maryland Medical College, Baltimore, 1909; member of the South Carolina Medical Association; member of the local and county school boards; aged 59; died, September 8, of coronary thrombosis.

Thomas Sisson Anderson, Live Oak, Fla.; Tallahassee College of Medicine and Surgery, Medical Department of the University of Florida, Jacksonville, 1886; member of the Florida Medical Association; aged 83; died, September 14, of myocarditis.

Roy Clayton Faust, Eugene, Ore.; Sioux City (Iowa) College of Medicine, 1905; member of the Oregon State Medical Society; aged 62; on the staff of the Sacred Heart Hospital, where he died, September 10, of hypertensive heart disease.

Stephen Girard Lee ☉ East Orange, N. J.; Bellevue Hospital Medical College, New York, 1898; aged 66; on the staff of the Orange (N. J.) Memorial Hospital, where he died, September 9, of acute cerebral embolism and coronary thrombosis.

William Bowler Hubbell ☉ Elyria, Ohio; University of Wooster Medical Department, Cleveland, 1898; served during the World War; on the staff of the Elyria Memorial Hospital; aged 66; died, September 26, of myelogenous leukemia.

Edson Andrew Blake, Waterloo, Que., Canada; McGill University Faculty of Medicine, Montreal, 1906; for many years chairman of the school board; aged 61; died, September 7, in the Royal Victoria Hospital, Montreal.

Clarence Albert Ransom ☉ East Falls Church, Va.; Johns Hopkins University School of Medicine, Baltimore, 1918; served during the World War; county coroner; aged 50; died, September 23, of a self-inflicted bullet wound.

Isaac Peirce, Tazewell, Va.; Jefferson Medical College of Philadelphia, 1888; member of the Medical Society of Virginia; aged 77; died, September 18, at the Bluefield (W. Va.) Sanitarium of gastric ulcer and hemorrhage.

Laura L. Liebhardt, Edgewater, Colo.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1884; aged 80; died in September of complications resulting from a fractured hip received in a fall.

Frederick William Munro ☉ Grosse Pointe, Mich.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1924; served during the World War; aged 41; died, September 15, in the Harper Hospital, Detroit.

Hugh Ellen Longino, Texarkana, Texas; University of Arkansas School of Medicine, Little Rock, 1916; member of the Arkansas Medical Society; served during the World War; aged 47; died, September 2.

Samuel Isaac Brody, Brooklyn; Universität Bern Medizinische Fakultät, Switzerland, 1937; first lieutenant, medical reserve corps, U. S. Army; aged 28; died, July 18, of sub-acute bacterial endocarditis.

Edward Harry Levy, Saranac Lake, N. Y.; Cornell University Medical College, New York, 1922; aged 42; died, September 24, in the New York State Hospital, Ray Brook, of pulmonary tuberculosis.

Houston Bate, Savannah, Tenn.; Meharry Medical College, Nashville, 1931; aged 38; died, September 27, in the Florida Agricultural and Mechanical College Hospital, Tallahassee, of cardiorenal disease.

Thomas Edward Waldie ☉ New York; Cornell University Medical College, New York, 1907; on the staff of the Misericordia Hospital; aged 56; died, September 18, in the Bellevue Hospital.

Robert Wellington Hall, Essex, Conn.; Bellevue Hospital Medical College, New York, 1894; formerly physician for the fire department of Brooklyn; aged 71; died, September 5, of heart disease.

Gregorio del Amo, Los Angeles; Universidad Central de España Facultad de Medicina, Madrid, Spain, 1878; aged 83; died, September 10, of bronchopneumonia and cerebral hemorrhage.

Charles Aylmer Fowler, Bend, Ore.; Chicago Medical College, 1884; city health officer; aged 83; died, September 17, at St. Charles Hospital of a fractured hip received in a fall.

Ernest Burnett, Hattiesville, Ark.; College of Physicians and Surgeons, Little Rock, 1908; member of the Arkansas Medical Society; aged 59; died, September 13, of myocarditis.

Martin Henry Nester, Rogers City, Mich.; Detroit College of Medicine, 1904; for many years county school commissioner and county coroner; aged 71; died, September 18.

Herman J. Rickhoff, Hermann, Mo.; St. Louis College of Physicians and Surgeons, 1904; aged 63; died, September 17, in the Barnes Hospital, St. Louis, of cerebral hemorrhage.

Frank Chester Reynolds ☉ Chico, Calif.; University of Southern California School of Medicine, Los Angeles, 1935; aged 32; died in September of a self-inflicted bullet wound.

Wylie R. Holloway, Center Ridge, Ark.; University of Arkansas School of Medicine, Little Rock, 1907; member of the Arkansas Medical Society; aged 72; died, September 11.

Julius Michaelis, Brooklyn; Long Island College Hospital, Brooklyn, 1906; on the staff of the Samaritan Hospital; aged 66; died, September 20, of coronary thrombosis.

Samuel Koppelman, Newtown, Conn.; Temple University School of Medicine, Philadelphia, 1937; on the staff of the Fairfield State Hospital; aged 30; died, September 3.

Harold Walsworth Bell, Camden, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1902; aged 64; died, September 10, of coronary thrombosis.

Hubert Douglas Karass, Milwaukee; Wisconsin College of Physicians and Surgeons, Milwaukee, 1899; aged 62; died, September 17, of cerebral hemorrhage and nephritis.

John Warren Norman, St. Paris, Ohio; University of Cincinnati College of Medicine, 1917; served during the World War; aged 50; died, September 1, in Tampa, Fla.

Joseph Carl Kimball, Joliet, Ill.; Northwestern University Medical School, Chicago, 1908; aged 58; was killed, September 26, in an automobile accident.

William H. McCollum, Jonesboro, Tenn.; Louisville (Ky.) Medical College, 1892; member of the Tennessee State Medical Association; aged 73; died, September 4.

Herbert Henry Boyer ☉ Saylorsburg, Pa.; Medico-Chirurgical College of Philadelphia, 1912; aged 53; died, September 24, of cirrhosis of the liver.

Harvey Thompson Mounser, Hattiesburg, Miss.; University of the South Medical Department, Sewanee, Tenn., 1907; aged 61; died, September 6.

Charles Hooper Edwards, Moorhead, Miss.; Memphis (Tenn.) Hospital Medical College, 1902; aged 65; died, August 26, in Jackson of myocarditis.

William Price Davis Jr., Trumansburg, N. Y.; Jefferson Medical College of Philadelphia, 1904; aged 61; died, August 15, of valvular heart disease.

Henry John Luecke, Lexington, Ky.; Cincinnati College of Medicine and Surgery, 1901; aged 67; died, September 28, of injuries received in a fall.

John Frick, Memphis, Tenn.; Memphis Hospital Medical College, 1886; aged 75; died, September 18, in St. Joseph's Hospital of pneumonia.

Emily Walworth Fifield, Los Angeles; Woman's Medical College of Baltimore, 1884; aged 83; died, September 22, of cerebral hemorrhage.

John William King ☉ Hartington, Neb.; Detroit College of Medicine, 1886; aged 78; was found dead, August 27, of coronary occlusion.

Robert William Shaw, Aylmer (West) Ont., Canada; Trinity Medical College, Toronto, 1895; aged 70; died, August 23.

James Murray Patton, Vandergrift, Pa.; College of Physicians and Surgeons, Baltimore, 1885; aged 83; died, August 5, of senility.

Anton Liska, Chicago; Jenner Medical College, Chicago, 1909; aged 71; died, September 21, of cerebral hemorrhage.

Henry George Gibson, Glouster, Ohio; Starling Medical College, Columbus, 1898; aged 74; died, September 1.

Alexander R. Jarrett, Granbury, Texas; Atlanta (Ga.) Medical College, 1880; aged 85; died, September 1.

Nellie E. Green, Fowler, Ind. (licensed in Indiana in 1897); aged 98; died, September 3, of uremia.

Bureau of Investigation

REDUCTIO AD ABSURDUM

Dangerous Procedure Resurrected from the Dark Ages for the Treatment of Obesity

During the past year many inquiries have come to the Bureau of Investigation about the so-called Millet System of Reducing. An inquiry addressed to the concern which seemed to be back of the System, the Interstate Publishing Company, 105 North Clark Street, Chicago, brought a reply indicating that the method is one originally belonging to Miss E. Millet of New Orleans and maintained by her as a secret until the Interstate Publishing Company was able to persuade her that she could better herself financially by incorporating her method in their book. Attached to this information is an order blank for full instructions for \$2.

In response to this order a mimeographed booklet is received entitled "The Millet System of Reducing" with a promise of another volume as soon as it is available. After calling attention to the fact that extensive exercises and diet are necessary to reduce the weight of the average person effectively and that steam baths, rubber girdles and such technics are merely temporary in their effect, the booklet affirms that it is necessary to consider something else and that, although the Millet system is drastic, it is at least practical. Frankly the promoters admit that when they first learned this secret they thought that it was too drastic and radical to be practical. Eventually, however, they were able to sell themselves on the idea of promoting the scheme at \$2 per sixteen-page, double-spaced mimeographed leaflet or its equivalent, for those who ordered later received a more extensive volume (141 pages of similar material titled "Facts you should know about Reducing" by Harland LeRoy "Under the Auspices of Reducers Institute of America").

After a warning that many readers will be shocked and even horrified, they disclosed that the system consists of bloodletting. They call attention to the fact that bloodletting was once used erroneously for the treatment of disease, but the remainder of the material contains some interesting statements: "Today doctors know that any considerable loss of blood through injuries is always followed by a rapid loss of weight. This is known as acute or secondary anemia. It is a well known fact that anemic people are thin people. There are some types of anemia which does not cause loss of weight, but that is not the type of anemia caused by loss of blood." It is hoped that no one will engage in this bloodletting or allow himself to be a victim of it to the point at which he will develop the condition which the physicians refer to as acute or secondary anemia.

The booklet suggests the withdrawal of 8 to 16 ounces (240 to 480 cc.) of blood at a sitting and points out that a large person can give as much as a quart of blood for transfusion purposes and go about his regular occupation without ill effects; that professional blood donors have given hundreds of pints of blood, a pint at a time, and still remained strong and healthy (and weighty.—Ed.).

In order to lure the prospective customer, the firm states: "To illustrate how little blood letting undermines the health, we cite the case of the Philadelphia professional strong man" who has given eight hundred and seventy-one blood transfusions and remains as strong as ever. The firm suggests that if you cannot afford the necessary doctor's fee, you have your name placed on the list of blood donors at some hospital nearby, and after getting a good start there you will have received enough money from the hospital to pay the physician's fees to continue the treatment, pointing out that hospitals, as a rule, will not take blood from a person more than once in six weeks and explaining, further, that "this is because a very high grade of blood is required for transfusion purposes, therefore the person desiring to reduce must take the rest of the treatments from

a physician, or do the work themselves." They might also have added: "Therefore, the blood of an individual who is bled more frequently is of an inferior quality."

They then suggest that "it is possible for a person to withdraw blood enough from themselves to cause a rapid loss of weight." They describe this procedure but neglect to describe a sterile technic prior to the injection of the needle into the vein. They include a disclaimer to the effect that "before anyone should attempt to use the method upon themselves, it is advisable to offer their blood for transfusion purposes at some charitable hospital," in the first place, because it is valuable, and because they can learn how simple and easy bloodletting can be. They suggest that if home treatment is to be employed, a physician should be consulted to determine the amount which should be withdrawn.

They finally break down and confess that, like a drastic diet, the Millet System naturally leaves the user in a somewhat underpar condition for a while (mostly for as long as he continues the pernicious practice.—Ed.). Therefore, according to the promoters, you should engage in it only when the weather is favorable, and also take "some good vitamin tablets" while under treatment. The promoters claim that another advantage of this system over unscientific dieting is that the body loses none of the necessary vitamins, minerals or other health-giving elements. Just exactly how this is accomplished while blood is taken as a routine from the body is a bit difficult to understand.

They conclude by stating that "Of course it is understood that once the desired weight has been attained by this method, the diet and amount of exercise must be regulated to maintain this weight," thus ending, as do all other proposed schemes for weight reduction, with the maintenance of a regimen which will permit the weight to be reduced or stay reduced. The concluding sentence is "Every overweight person knows that it is comparatively easy to keep from gaining weight, it is taking off weight that is such a futile task." This is an interesting conclusion, in view of the fact that they opened their presentation by calling attention to the fact that other methods of reducing were largely temporary in effect.

The information contained in this booklet is supposed to be worth \$2—or, at least, that is the price one must pay to obtain it. Furthermore, in filling out the order blank for the book, one signs an agreement "not to disclose this Secret Method to anyone (my physician excepted)." An interested physician, however, thought little enough of this agreement which some one presumably made to forward a copy of the booklet to the Bureau.

The later book referred to above contained more extensive details of the inadequacy of other methods (not objecting strenuously however to "moderate" use of thyroid and benzedrine as directed by a physician) and also contained suggestions for "after treatment" which consisted of diet.

Various effective measures for the reduction of weight have been promoted which were detrimental and in some cases fatal to the persons who engaged in the procedure. In some respects the Millet System is similar to these. It is even reasonable to question whether or not the concern expects the purchaser to follow its method of reducing or is even interested at all beyond the receipt of the \$2 for the booklet. Otherwise it is doubtful whether the promoters would call attention to the fact that hospitals would not withdraw blood frequently enough from the patient to produce a continued reduction in weight. If sufficient blood is allowed to escape from the system at regular and frequent intervals, there will be a reduction in weight. If the quantity removed and the frequency and regularity of removal are sufficient, death will ensue. The Millet System is a vicious plan for selling dangerous advice that intelligent people will not follow and that will inevitably harm those who do follow it. No doubt the Post Office Department and the Federal Trade Commission will find ways to terminate this pernicious performance.

Correspondence

HIGH LIGATION IN TREATMENT OF VARICOSE VEINS

To the Editor:—A communication to THE JOURNAL, August 16, page 553, by Dr. J. M. Hayes questions the safety of high ligation in the treatment of varicose veins. Instead, injection treatment is advocated in the upper part of the thigh as well as in the lower leg.

Pulmonary embolism is probably the chief hazard in the treatment of varicose veins. It was the cause of the high mortality of early radical surgical procedures (vein resection, vein stripping and so on), after which patients were of necessity bedfast. Later, with the development of ambulatory injection treatment, embolism became rare.

Obviously any form of treatment of varicose veins, whether by surgery, injection or ligation, involves the possibility of embolism, since all forms of treatment produce thrombi. But it seems unlikely that ambulatory ligation of the upper end of the great saphenous vein is more dangerous than the injection of sclerosing agents into the upper portion of the same vein without ligation. Just how does one limit clot formation in the upper end of the saphenous vein and prevent its propagation into the femoral vein?

Since 1934 I have been in charge of the varicose vein clinic at the Broadlawns General (Polk County) Hospital, Des Moines, Iowa. During this period the ligation treatment found increased usefulness. At present about 50 per cent of patients are treated by a high ligation (combined with low ligation when indicated) and retrograde injection. The remaining 50 per cent are treated by injection treatment alone. More than 100 patients have been submitted to ligation without mortality or serious complications. The good results obtained and the relative permanence of these results make me feel that ligation is a valuable and safe procedure, provided the following criteria are observed in selecting cases:

1. Patients with acute, subacute or latent phlebitis are potentially the most dangerous group. Ligation should not be performed on such patients for at least one year after subsidence of the last attack of phlebitis.
2. Patients with varicose ulcers should not be submitted to ligation. The ulcer should first be healed by supportive methods (Unna's boot and the like) to clear up any latent infection in the inguinal lymph nodes which might predispose to embolism.
3. Ligation should not be performed on pregnant women. I feel that the risk of precipitating thrombophlebitis or embolism is greater during pregnancy than at other times, because of stasis. Such patients are given supportive treatment (such as elastic bandages) until delivery. No treatment is advised for from three to six months post partum.
4. Ligation should not be performed on patients in poor physical condition, on the aged or on the obese.

The strict observance of these conditions has made ligation a safe procedure. As to permanence of results, ligation offers a greater chance of long term cure than injection alone. While ligation is not claimed as a permanent cure in all cases, recurrences over a five year period are rare, whereas it is common to see large varices return to their original condition one year after injection treatment alone.

Ligation with retrograde injection has been a definite advance in the treatment of varicose veins. The careful selection of patients for ligation is of the utmost importance in eliminating mortality and morbidity.

J. M. BRUNER, M.D., Des Moines, Iowa.

ECLAMPSIA

To the Editor:—The work of C. H. Burn, improved on by Griffith of the University of Pennsylvania, shows that there is such a thing as an antidiuretic principle which can be titrated by injection of blood into assay rats. Why could not this particular experiment be explained in this way: As the serum from the eclamptic donor is given, the antidiuretic level of the guinea pig in question is raised and raised so that a state of eclampsia exists in the guinea pig, a state of retention of the electrolytes sodium and potassium to the point of allergy—allergy to anything. The antidiuretic level of the serum of the patient is a reflection of the activity of the pituitary of the eclamptic patient.

W. B. S. THOMAS, M.D., Dover-Foxcroft, Maine.

NOTE.—The essential point in Yamada's research is his experimental evidence of a primary denaturation of normal placental proteins in eclamptic patients, rendering these proteins highly antigenic for both man and experimental animals. Until such abnormal protein antigenicities are definitely ruled out, the so-called anaphylactic theory of puerperal eclampsia must be considered a theoretical possibility.—Ed.

LEAD AND SILVER IN URINARY CALCULI

To the Editor:—In THE JOURNAL, July 5, 1941, page 20, Francis Carter Wood reported on studies he had made of the incidence of lead in urinary calculi. He drew attention to the finding by Trumper and Gordy (THE JOURNAL, March 29, 1941, p. 1389) of 3 per cent of lead in a phosphatic ureteral calculus while the urine contained lead in so-called normal amount. Dr. Wood compared the lead content of urinary stones of the vintage 1850-1860, examining 20, all of which contained lead, thus disproving any deduction that ethyl-lead gasoline necessarily accounts for increased lead output in the urine today. He also mentioned the fact that traces of copper and silver were regularly present, as well as other metals.

At a meeting of the Pathological Society of Eastern New York, Dec. 9, 1932, Dr. Gustavus H. Klinck Jr. (*Arch. Path.* 15:751 [May], 16:598 [Oct.] 1933), then my assistant in the Department of Pathology in Albany Medical College, reported a case of severe argyria in a woman aged 55 who had symptoms of a bladder disturbance. A roentgenogram showed a dense shadow occupying the entire area of the bladder. Dr. E. P. McDonald operated and removed a stone weighing 575 Gm. It was round, 10 cm. in diameter and dark red with pale yellowish laminations. Dr. A. P. Knudson, professor of biochemistry, examined various portions of the stone for silver but could find no trace of any.

Silver was demonstrated in the skin, and at autopsy several months later silver granules were found in many organs, although none could be seen in Kupffer's cells in the liver. The kidneys showed advanced pyelonephritis, but silver was abundant in or about the glomerular endothelium and along the basement membrane of the cortical tubules but not definitely in the cortical epithelium. The stroma of the medulla and cortex contained much silver, free and in phagocytes. The pelvis, ureters and bladder showed much chronic inflammation.

I must confess that, since there was much visible silver in the body and a large quantity in the kidney itself, we would not have been surprised to find the huge bladder stone harboring silver in ingot proportions, but it contained none. It was not tested for the presence of lead.

Some pathologists state that silver is deposited in tissues as an insoluble albuminate. Others do not commit themselves as to the molecular structure of the dark granule of argyria. Silver apparently is precipitated from solution by certain cells, especially fibroblasts in the medulla of the kidney, by smooth

muscle cells connected with hairs and around coil glands of the skin. At any rate, the lead molecule must be in more soluble form to be excreted by the kidney and thus is able to form part of urinary calculi. Silver oxide, or its albuminate, appears to be much less soluble and is largely confined to an extracellular position, so its absence from urinary calculi even as huge as that mentioned would seem to be explained. The microchemistry of argyria and plumbism, however, requires further study.

VICTOR C. JACOBSEN, M.D., Troy, N. Y.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 16-17, 1942. Council on Medical Education and Hospitals, Sec., Dr. William D. Cutter, 535 North Dearborn Street, Chicago.

MEDICAL CORPS, UNITED STATES NAVY

Examination. Assistant Surgeon with the permanent rank of Lieutenant (junior grade) and Acting Assistant Surgeon with the probationary rank of Lieutenant (junior grade), Jan. 5-9. Examination will be held at the Naval Hospitals at Chelsea, Mass., Newport, R. I., Brooklyn, Philadelphia, Norfolk, Va., Charleston, S. C., Pensacola, Fla., Corpus Christi, Tex., San Diego and Mare Island, Calif., Puget Sound, Wash., Great Lakes, Ill., Pearl Harbor, T. H., and Naval Medical Center, Washington, D. C. Apply Rear Admiral Ross T. McIntire, M.D., Surgeon General, U. S. Navy, Washington, D. C.

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, October 25, page 1462.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, Feb. 9-11. Part III. Boston, November. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written*. Part I. Various centers, March 31. Final date for filing application is Dec. 31. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York City.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral*. Dec. 12-13. Final date for filing application is Nov. 8. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral*. April in advance of the meeting of the American College of Physicians and June, in advance of the meeting of the American Medical Association. Applications should be on file 6 weeks in advance of the date of oral examination. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written*. Part I. Group B. Various centers, Jan. 3. *Oral*. Part II. Groups A and B Atlantic City, May or June. Final date for filing application is March 1. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Written*. March 7. Final date for filing application is Dec. 1. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral and Written*. All Groups. Philadelphia, June, preceding the meeting of the American Medical Association. Final date for filing application is March 1. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha, Neb.

AMERICAN BOARD OF PEDIATRICS: *Oral*. Philadelphia, March or April, at the time of the Region I meeting of the American Academy of Pediatrics. Cleveland, May, at the time of the Region III meeting of the American Academy of Pediatrics. Los Angeles, May, at the time of the Region IV meeting of the American Academy of Pediatrics. *Written*. Locally, approximately 6 weeks in advance of the date of oral examination. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF RADIOLOGY: *Oral*. All Groups. Atlantic City, June 4. Final date for filing application is April 1. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave., S. W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Oral*. Part II. New York Nov. 10-11. A meeting of the board will follow on the 12th. Sec., Dr. J. Stewart Rodman, 225 S. Fifteenth St., Philadelphia.

AMERICAN BOARD OF UROLOGY: *Written*. Various centers, December. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

California Reciprocity Report

The Board of Medical Examiners of the State of California reports 63 physicians licensed to practice medicine by reciprocity and 10 physicians so licensed by endorsement from January 2 through July 12. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Yale University School of Medicine.....	(1935)		Penna.
Howard University College of Medicine.....	(1930)		Kansas
Emory University School of Medicine.....	(1917)		S. Carolina
(1937) Georgia			
Chicago College of Medicine and Surgery.....	(1915)		Missouri
Loyola University School of Medicine.....	(1929)		Montana,
(1934) New Jersey, (1939) Illinois			

Northwestern University Medical School.....	(1900)	Illinois,
(1925) New York, (1932) Oklahoma, (1939) Utah		
Rush Medical College.....	(1919)	Michigan, (1928)
The School of Medicine of the Division of the Biological Sciences.....	(1936)	New York, (1938)
University of Illinois College of Medicine.....	(1927)	Illinois
(1936) Michigan		Wisconsin,
State University of Iowa College of Medicine.....	(1935), (1938)	Iowa
University of Kansas School of Medicine.....	(1934)	Missouri
University of Louisville School of Medicine.....	(1934)	Ohio,
(1937) North Dakota		
Louisiana State University Medical Center.....	(1936)	Louisiana
Tulane University of Louisiana School of Medicine.....	(1936)	Louisiana
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1932)	New York
Harvard Medical School.....	(1937)	Maryland
University of Minnesota Medical School.....	(1914), (1925), (1934, 2), (1935), (1937)	Minnesota, (1932) Ohio
St. Louis University School of Medicine.....	(1930)	Oregon,
(1927), (1931), (1937) Missouri		
Washington University School of Medicine.....	(1938)	Missouri
Creighton University College of Medicine.....	(1931)	Nebraska
Lincoln Medical College of Coter University.....	(1908)	Nebraska
University of Nebraska College of Medicine.....	(1920), (1930)	Nebraska,
(1931) Washington		
Columbia University College of Physicians and Surgeons.....	(1934)	W. Virginia
New York University College of Medicine.....	(1936), (1938)	New York
University and Bellevue Hospital Medical College.....	(1911), (1917), (1925)	New York
Ohio State University College of Medicine.....	(1923)	Ohio
Western Reserve University School of Medicine.....	(1933)	Ohio
University of Oklahoma School of Medicine.....	(1936)	Oklahoma
University of Oregon Medical School.....	(1934), (1937)	Oregon
University of Pennsylvania School of Medicine.....	(1925)	N. Dakota,
(1937) Pennsylvania		
University of Tennessee College of Medicine.....	(1919)	Tennessee
Marquette University School of Medicine.....	(1930, 2)	Wisconsin
University of Manitoba Faculty of Medicine.....	(1936)	S. Dakota
University of Edinburgh Faculty of Medicine.....	(1919)	Nebraska,
(1937) Pennsylvania		

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists.....	(1938)	N. B. M. Ex.	
Rush Medical College.....	(1915)	N. B. M. Ex.	
Harvard Medical School.....	(1936)	N. B. M. Ex.	
Washington University School of Medicine.....	(1934)	U. S. Navy	
Cornell University Medical College.....	(1929)	N. B. M. Ex.	
Duke University School of Medicine.....	(1934)	N. B. M. Ex.	
Jefferson Medical College of Philadelphia.....	(1919)	U. S. Navy	
University of Pennsylvania School of Medicine.....	(1929)	N. B. M. Ex.	
Vanderbilt University School of Medicine.....	(1931)	N. B. M. Ex.	
University of Toronto Faculty of Medicine.....	(1927)	N. B. M. Ex.	

California Reciprocity Report

The Board of Medical Examiners of the State of California reports 56 physicians licensed to practice medicine by reciprocity and 2 physicians so licensed by endorsement from July 15 through August 14. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists.....	(1939)		Michigan
University of Colorado School of Medicine.....	(1939), (1940)		Colorado
Yale University School of Medicine.....	(1909)		R. Island,
(1930) New York, (1932) Connecticut			
Loyola University School of Medicine.....	(1932)		Illinois
Northwestern University Medical School.....	(1933)		Kansas
Rush Medical College.....	(1932) Minnesota, (1928), (1932)		Illinois
University of Illinois College of Medicine.....	(1935)		Illinois
State University of Iowa College of Medicine.....	(1925)		Iowa
Univ. of Kansas School of Med. (1934, 2), (1937), (1940, 2)			Kansas
Southwestern Homeopathic Medical College and Hospital, Louisville.....	(1904)		Kentucky
Johns Hopkins Univ. School of Med. (1925), (1931), (1931)			Maryland
Harvard Medical School.....	(1931)		Mass.
University of Michigan Medical School.....	(1931)		Michigan
Wayne University College of Medicine.....	(1939)		New York
Univ. of Minnesota Medical School.....	(1926), (1935), (1939)		Minnesota
St. Louis University School of Medicine.....	(1926)		Missouri
Washington University School of Medicine.....	(1931)		Wyoming
John A. Creighton Medical College.....	(1914) Iowa, (1915)		Nebraska
Univ. of Nebraska College of Med. (1921), (1929), (1933)			Utah
Columbia Univ. College of Physicians and Surgeons.....	(1937)		R. Island
Cornell University Medical College.....	(1935)		
New York Homeopathic Medical College and Flower Hospital.....	(1928)		New York
University of Buffalo School of Medicine.....	(1909)		New York
Univ. of Rochester School of Medicine and Dentistry.....	(1937)		New York
Ohio State University College of Medicine.....	(1930)		Penna.
University of Cincinnati College of Medicine.....	(1916), (1930)		Ohio,
(1935) Minnesota			
Western Reserve Univ. School of Med. (1932), (1933), (1935)			Ohio
Medico-Chirurgical College of Philadelphia.....	(1899)		Penna.
Univ. of Pennsylvania School of Med. (1911) Penna. (1936)			Ohio
Woman's Medical College of Pennsylvania.....	(1933)		New York
Vanderbilt University School of Medicine.....	(1935)		N. Carolina
Medical College of Virginia.....	(1934)		Virginia
Marquette University School of Medicine.....	(1931)		Wisconsin
University of Wisconsin Medical School.....	(1935)		Wisconsin
First Moscow Medical Institute.....	(1919)		Minnesota

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Washington University School of Medicine.....	(1929)	N. B. M. Ex.	
University of Pennsylvania School of Medicine.....	(1924)		Hawaii

Maine July Report

The State of Maine Board of Registration of Medicine reports the written examination for medical licensure held at Augusta, July 1-2, 1941. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Sixteen candidates were examined, 14 of whom passed and 2 failed. Seven physicians were licensed to practice medicine by reciprocity and 3 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Harvard Medical School	(1933), (1941)		2
Tufts College Medical School	.. (1940)		1
Columbia University College of Physicians and Surgeons	.. (1931), (1940)		2
Hahnemann Med College and Hospital of Philadelphia	(1940)		1
Temple University School of Medicine	.. (1941)		1
University of Pennsylvania School of Medicine	(1940), (1941)		2
Laval University Faculty of Medicine	.. (1940)		1
Albert Ludwigs Universität Medizinische Fakultät, Freiburg	.. (1936)		1
Medizinische Fakultät der Universität Wien	.. (1938)		1
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultása, Budapest	.. (1930)		1
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons of Edinburgh and of the Royal Faculty of Physicians and Surgeons, Glasgow	(1935)		1
School	FAILED	Year Grad.	
University of Montreal Faculty of Medicine	.. (1941)		
Regia Università degli Studi di Padova Facoltà di Medicina e Chirurgia	.. (1936)		
School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Yale University School of Medicine	.. (1904)		Dist Colum
University of Maryland School of Medicine and College of Physicians and Surgeons	(1935), (1937)		Maryland
Harvard Medical School	.. (1936)		Penna.
University of Michigan Medical School	(1935)		Michigan
McGill University Faculty of Medicine	.. (1925)		Maryland
Medizinische Fakultät der Universität Wien	(1920)		Maryland
School	LICENSED BY ENDORSEMENT	Year Grad.	
Harvard Medical School	(1925), (1934), (1939)		

Minnesota June Report

The Minnesota State Board of Medical Examiners reports the written examination for medical licensure held at Minneapolis, June 17-19, 1941. The examination covered 12 subjects and included 60 questions. An average of 75 per cent was required to pass. Fifty-eight candidates were examined, all of whom passed. Three physicians were licensed to practice medicine by reciprocity and 4 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
University of Colorado School of Medicine	(1935)		1
Northwestern University Medical School	.. (1940), (1941)		2
Rush Medical College	.. (1939)		1
University of Louisville School of Medicine	.. (1939)		1
Johns Hopkins University School of Medicine	(1941)		1
Harvard Medical School	.. (1938)		1
University of Minnesota Medical School (1940, 4), (1941, 6), (1941, 23)*	.. (1940, 2), *		35
Creighton University School of Medicine	.. (1941)		1
University of Nebraska College of Medicine	.. (1938)		1
Columbia Univ. College of Physicians and Surgeons	(1941)		1
Syracuse University College of Medicine	.. (1938)		1
Hahnemann Med College and Hospital of Philadelphia	(1940)		1
University of Texas Faculty of Medicine	.. (1939)		1
Medical College of Virginia	.. (1938)		1
Marquette University School of Medicine	.. (1941, 2)		2
University of Wisconsin Medical School	.. (1939), (1940, 3)		4
University of Manitoba Faculty of Medicine	(1939), (1941)		2
McGill University Faculty of Medicine	.. (1937)		1
School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Rush Medical College	.. (1934)		Wisconsin
State University of Iowa College of Medicine	(1939)		Iowa
Marquette University School of Medicine	(1926)		Wisconsin
School	LICENSED BY ENDORSEMENT	Year Grad	
Harvard Medical School	(1936), (1939)		
Duke University School of Medicine	.. (1937)		
University of Pennsylvania School of Medicine	.. (1940)		

* These applicants received the M.B. degree and will receive the M.D. degree on completion of internship.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Governmental Hospitals: Operation of Hospital by County a Governmental, Not a Proprietary, Function.—The plaintiff brought an action for damages against the County of Colusa (Calif.), the board of supervisors of that county, the director of the county hospital (a physician) and two nurses employed in the hospital. She alleged that the county maintained in a proprietary capacity a hospital which was under the management and control of the board of supervisors of the county, that, requiring immediate hospitalization and emergency treatment, she was admitted to the hospital as a pay patient and while a patient therein "and in need of constant nursing, care and attention, and while in a state of delirium from fever and illness, and while wholly unconscious, the defendants failed to render such necessary care and attention by leaving plaintiff unattended, and as a result thereof she fell from her bed in the hospital and was injured." Demurrers interposed by all the defendants were sustained by the trial court, and the plaintiff appealed to the district court of appeal, third district, California.

The demurrers interposed by the county and by the board of supervisors were based essentially on a rule of law assumed by the trial court that a county cannot be sued for acts arising out of its performance of a governmental function and that the county in operating a hospital was performing a governmental function. The plaintiff contended, however, that the demurrers were improperly sustained, since in her complaint she alleged that the hospital wherein she was injured was operated in a proprietary capacity by the county, and that the defendants by demurring to her complaint admitted the truth of that allegation, that is, admitted that the hospital was operated in a proprietary capacity by the county, the county would have been liable for damages occasioned by the negligence of its servants and agents. The general rule of pleading, however, said the district court of appeal, on which the plaintiff's contention is based, does not admit a conclusion of law, nor does it admit the construction placed on an instrument pleaded in the complaint, or facts impossible in law, or allegations contrary to facts of which a court may take judicial knowledge. In this case the allegation by the plaintiff that the hospital was operated in a proprietary capacity by the county was not admitted by the demurrers interposed, since it has been previously held by the Supreme Court of this state that the operation of a county hospital is a governmental function. *Sherbourne v. Yuba County*, 21 Cal. 113, 81 Am. Dec. 151. The complaint in this case, moreover, continued the court, further alleges that the county hospital was maintained and conducted by the county for the purpose of furnishing hospitalization to the following persons: first, to all indigent sick in the county free of cost; second, to all resident veterans and their dependents free of cost; third, to other residents of the county as the facilities would permit on the payment of the cost of hospitalization, and, fourth, in the case of an emergency to any one needing attention. In addition, remarked the court, any expectant mother who is unable to pay for her necessary care must also be admitted to the hospital. From these classifications it would appear that the county was conducting a general public hospital and that it cannot be held as a matter of law that the hospital was conducted in a proprietary capacity, regardless of any allegations to that effect in the complaint. The fact that the hospital admitted certain paying patients did not convert a public hospital into a proprietary or private hospital. The court accordingly concluded that the hospital was operated by the county in a governmental capacity and that the demurrers with respect

to the county and to the board of supervisors were properly sustained.

The court next considered the propriety of the trial court's action in sustaining the demurrer interposed by the physician-director of the hospital. The gist of the complaint, said the court, against the physician-director is that he was negligent in his supervision of the nurses, but he as director did not apparently select or employ these nurses, nor was he, as director, responsible to the plaintiff for any failure of supervision but was answerable only to the county that employed him. As indicative of the director's liability, the plaintiff referred to *Davie v. Board of Regents*, 66 Cal. App. 689, 227 P. 247, which held that, even if the regents of a university which conducted a hospital were not liable for the tort of an employee of the university, nevertheless the employees themselves were individually chargeable with such negligence, and that it made no difference whether the hospital conducted by the university and of which the negligent employees were employed was being conducted in a proprietary capacity or as a governmental function. That is true, said the court, where the injuries resulted from the negligent care and treatment of the patient by the employees, but here the director was not alleged to have had the care of the plaintiff—that duty resting on the attendants of the hospital—and the injuries sustained by the plaintiff had nothing to do with the lack of skill or care of the director of the hospital. Therefore, since the personal care of the plaintiff was not on the physician-director, since there is no allegation that he directed the nurses to do or refrain from doing anything that caused harm to the plaintiff and since there was no contract between the plaintiff and the physician-director, there was no cause of action stated against him.

The situation of the defendant nurses, continued the court, however, is somewhat different from that of the physician-director. The care and attention of the plaintiff was personally entrusted to them, and the complaint alleges that they failed to render such service. When one has undertaken to render assistance or care, even if a volunteer, the law imposes a duty of care toward the person assisted. The district court of appeal concluded that the trial court should have overruled the demurrers of the two defendant nurses and required them to answer.

Accordingly, the judgment in favor of the defendants county, the board of supervisors and the physician-director of the hospital was affirmed and that portion of the judgment in favor of the nurses was reversed, with the right given them to plead further.—*Griffin v. Colusa County*, 113 P. 2d. 270 (Calif., 1941).

Society Proceedings

COMING MEETINGS

American College of Surgeons, Boston, Nov. 3-7. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.
American Society of Tropical Medicine, St. Louis, Nov. 11-14. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
Annual Conference of Secretaries of Constituent State Medical Associations, Chicago, Nov. 14-15. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.
Associated Anesthetists of the United States and Canada, Boston, Nov. 3-7. Dr. C. J. Wells, 1932 S. Salina St., Syracuse, N. Y., Secretary.
Central Society for Clinical Research, Chicago, Nov. 7-8. Dr. Carl V. Moore, Washington University School of Medicine, St. Louis, Secretary.
National Society for the Prevention of Blindness, New York, Dec. 4-6. Mrs. Eleanor Brown Merrill, 1790 Broadway, New York, Executive Director.
Puerto Rico, Medical Association of, Santurce, Dec. 11-14. Dr. David E. Garcia, P. O. Box 3866, Santurce, Secretary.
Radiological Society of North America, San Francisco, Dec. 1-5. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
Society for the Study of Asthma and Allied Conditions, New York, Dec. 6. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
Southern Medical Association, St. Louis, Nov. 10-13. Mr. C. P. Loran, Empire Bldg., Birmingham, Ala., Secretary.
Southern Surgical Association, Pinehurst, N. C., Dec. 9-11. Dr. E. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
Southwestern Medical Association, El Paso, Texas, Nov. 20-22. Dr. Louis W. Breck, 116 Mills St., El Paso, Secretary.
Western Surgical Association, St. Paul, Dec. 5-6. Dr. Arthur R. Metz, 2449 Washington Blvd., Chicago, Secretary.

THE AMERICAN RHEUMATISM ASSOCIATION

Eighth Annual Meeting, held in Cleveland, June 2, 1941

DR. A. R. SHANDS JR., Wilmington, Del., Secretary

Gold Therapy in Rheumatoid Arthritis: Presidential Address

DR. RALPH H. BOOTS, New York: As the four papers in this symposium on chrysotherapy to be presented are reports of experimental studies, it seems fitting to review briefly our present knowledge of gold therapy, especially its dangers and limitations, so that it does not fall into the status of another cure for rheumatism and suffer the fate of the many previous "fads." Too often the harmful effects of a new drug outweigh its therapeutic effect. The preparations used today are toxic in 25 to 40 per cent of the cases, and it is timely to emphasize their dangers and the fact that they have been recommended only in one type of arthritis, namely rheumatoid arthritis.

According to Parr and Shipton, the use of gold in medicine dates back at least to the eighth century, when Abu Moussa the Wise recommended it as a cureall for every known disease. Paracelsus, the alchemist and chemist, in about the year 1500 A. D., recommended a so-called elixir of life, which was composed of gold and mercury, and gold was first used for tuberculosis in his time. Owing to serious accidents, it was dropped until many years later.

In recent time, gold therapy, or chrysotherapy, had been recommended for tuberculosis and cutaneous diseases before its use was proposed in rheumatoid arthritis by Feldt. Schiemann and Feldt in 1926 found that certain organic gold compounds produced, on subcutaneous injection, a distinct therapeutic effect on streptococcal infections in mice. Feldt also showed that compounds in which the gold was bound through a sulfhydryl group were most effective. All the gold preparations in use today make use of this principle. Recently Dawson and Hobby, using gold sodium thiomalate, have demonstrated definite chemotherapeutic properties against experimental hemolytic streptococcus infections in mice. Collier found the same and also that gold preparations were of value in treating polyarthritis in mice whose joints were probably infected with pleuropneumonia organisms.

A number of explanations have been offered for the beneficial action of gold salts in rheumatoid arthritis. Until recently the most popular was that it stimulated the reticuloendothelial system. In view of recent bacteriologic and immunologic studies, it would seem that it might have a direct chemotherapeutic effect on the causative agent.

Forestier was the first to popularize the use of gold salts in rheumatoid arthritis. He argued that "if gold salts are active in a chronic disease like human tuberculosis, why should they not be active in another chronic disease in which an important infectious factor seems to be present?" At that time some French authorities regarded rheumatoid arthritis as having a tuberculous etiology. This was the basis of his conception and the start of his use of gold salts in the treatment of arthritis. He attempted to arouse interest in his work in America in 1934. Following his visit here we treated a small number of patients in this manner. The sixth patient treated developed such severe exfoliative dermatitis that we considered the therapy too toxic and gave it up until 1938, when English investigators caused an increased interest by their enthusiastic reports. Since then numerous papers on this subject have appeared in this country. According to a recent personal communication Dr. Forestier is still enthusiastic about gold therapy, after thirteen years.

As a result of the experience of others and three years' experimental trial of chrysotherapy in the Arthritis Clinic at the Presbyterian Hospital, New York City, I have come to believe the following:

1. This form of therapy offers definite promise in the treatment of rheumatoid arthritis.
2. Gold salt therapy should not be recommended for any form of arthritis except rheumatoid. Because of its toxicity, only proved cases of rheumatoid arthritis justify its use.

3 No more than two thirds of the patients are able to tolerate full courses of the drug, and of these about 50 per cent exhibit striking improvement. In other words, we look for such improvement in 33 per cent of our rheumatoid arthritis cases. By striking improvement is meant a decided objective and subjective change in the patient, accompanied by a convincing drop in the blood sedimentation rate. This degree of improvement represents a change which, in our experience, occurs only rarely, either spontaneously or as a result of any other therapeutic procedure.

4 Although chrysotherapy offers great promise today, in its present form it should not be regarded as the cure for rheumatoid arthritis, and it would seem imperative that great emphasis be placed on those other forms of treatment which in former years have been shown to be of real value, namely rest, nutrition, transfusions, removal of infections, climate, prevention of deformities and physical therapy.

5 Any physician contemplating the use of gold should visit one of the clinics which is using this form of therapy and acquaint himself with the toxic reactions, as I am sure that an intimate knowledge of the early appearance of these reactions is necessary to lessen the percentage of those of the severer types.

6 The future of gold salts lies largely in the hands of the chemists. It would seem that in the future a more active and less toxic preparation might be produced. Until then, despite its real value, its popularity will have its ups and downs, depending on the number of toxic reactions encountered by any individual physician.

The Influence of Gold Sodium Thiomalate (Myocrysin) on the Prevention and Cure of Hemolytic Streptococcus Arthritis in Rats

DRS SIDNEY ROTHBARD, D MURRAY ANGLINE and RUSSELL L. CECIL, New York. Previous experiments have revealed that a strain of hemolytic streptococcus would induce arthritis on intravenous injection in 100 per cent of animals. Gold sodium thiomalate was found to be effective in the prevention of this disease but was not so effective against a more virulent culture of the same strain. Sulfanilamide and sulfathiazole were found to be as effective in the prevention of this disease as the gold salt. Gold and sulfonamide compounds did not have a curative effect on the arthritis. Although gold was found to be bactericidal *in vitro*, experiments *in vivo* showed no difference in the number of bacteria in the peripheral blood, bone marrow, liver and spleen of treated and nontreated animals.

Observations were made on the toxic effects of gold sodium thiomalate given to animals over various periods of time. Complete blood studies revealed eosinophilia in the peripheral blood of all the animals injected with gold over a prolonged period. A severe renal injury that resulted in the death of the animal was observed after an injection of 15 mg or more of gold. As little as 0.5 mg produced renal damage in 75 per cent of the rats, whereas 1 mg or more produced it in every instance. Gold was observed microscopically within the cells and lumens of the renal tubules.

From these studies it appears that gold sodium thiomalate protects rats against hemolytic streptococcus arthritis but does not cure it. Since the effective dose is so close to the lethal dose, great caution is necessary in its administration.

The Curative Effect of Gold Salts in Experimental Chronic Arthritis of Mice with Special Reference to the Properties of Calcium Aurothiomalate

DR ALBERT B. SABIN and JOEL WARREN, PH D, Cincinnati. The experimental disease produced in mice by the type B mouse pleuropneumonia micro-organism differs from the experimental arthritis caused by pyogenic micro organisms (whether bacterial or of the rat pleuropneumonia group) in that it is a progressive, chronic, essentially proliferative arthritis which in its clinical and pathologic manifestations bears a certain resemblance to human rheumatoid arthritis. Chemotherapeutic studies carried out in the past two years revealed that, of many compounds tested,

only those which contained gold in a dissociable and chemically reactive state (i.e., noncolloidal) were capable of exerting a curative effect. With treatment started early after the appearance of arthritis and with adequate doses of gold salts it has been possible to obtain a complete and persistent curative effect in nearly 100 per cent of mice. As the dose approaches the minimal range the number of treated animals which lose their arthritis becomes smaller and the incidence of spontaneous recurrences after cessation of therapy is definitely increased. The arthritis disappeared completely within eight weeks or less after the beginning of therapy in 86 per cent of 603 mice treated with suitable gold compounds at the proper time but only in 21 per cent of 403 mice receiving the same compounds in less than minimal effective dosage or too late in the disease, and in only 5 per cent of 100 mice receiving ineffective compounds including colloidal gold, sodium salicylate, bismuth subsalicylate, fuadin (antimony), neoarsphenamine, silver arspenamine, sulfapyridine and sulfathiazole, among the 184 mice which served as the untreated controls in these tests the arthritis disappeared spontaneously in only 6 per cent.

A study of the influence of chemical structure of gold compounds on their toxicity as measured by the lethal effect on 20 Gm mice revealed that toxicity depended not on the concentration of gold in a given compound but rather on the nature of the radical to which the gold is attached and on the solubility or relative insolubility of the compound. However, while it was found that some gold compounds could be one hundred times more toxic than others, there was relatively little variation in the minimal therapeutic dose, especially among the soluble compounds. Of all the substances tested, calcium aurothiomalate was found to possess the greatest margin of safety as a chemotherapeutic agent. Of the three insoluble gold compounds studied, i.e. calcium aurothioglycollate, calcium aurothiomalate and aurothioglycoanilide, all were tolerated when as much as 100 mg (or 5 Gm per kilogram) was injected subcutaneously or intramuscularly in a single dose to 20 Gm mice, but they were not all equally effective as therapeutic agents. Thus, the minimal therapeutically effective amount administered as a single dose was 5 to 10 mg for calcium aurothioglycollate, about 10 mg for aurothioglycoanilide but only 0.5 mg for calcium aurothiomalate, and its curative effect appeared in almost one third of the time required by the other two. Calcium aurothiomalate was also the only insoluble compound whose minimal therapeutic dose was smaller than that of any of the soluble compounds tested. The minimal therapeutic amount of sodium aurothiomalate, administered as a single dose, was found to be about four times as large as that of the calcium salt, while the amount of calcium aurothiomalate tolerated by nearly all mice was twenty to fifty times greater than that of the sodium salt. The margin of "complete" safety was thus found to be at least one hundred times greater for calcium aurothiomalate than for sodium aurothiomalate.

Gold Metabolism and the Fate of Gold Injected in the Treatment of Arthritis

DR R. H. FREYBERG, W. D. BLOCK, PH D, and O. H. BUCHANAN, M.S., Ann Arbor, Mich. While patients with rheumatoid arthritis were receiving increasing amounts of gold sodium thiomalate, gold sodium thiosulfate or aurothiosulfide at weekly intervals (for approximately six weeks) the concentration of gold in the blood and the urinary, and in some cases the fecal, excretion of gold were measured daily by means of a new, highly sensitive, photoelectric colorimetric method. In addition, on the day of administration of the gold salt the blood and urine content of gold was determined one, two, four, six and twenty-four hours after injection. After the weekly dose became standardized, similar determinations of gold were made at intervals throughout the period of treatment and for several months thereafter. Occasionally the concentration of gold in synovial fluid and blood were measured simultaneously. In many other patients occasional determinations of gold in blood and urine were made during and after periods of chrysotherapy.

Gold metabolism and excretion studies have been carried out on patients during and after the administration of gold sodium

thiomalate, gold sodium thiosulfate and colloidal gold sulfide. Gold in the blood was always found to be in the plasma. It is eliminated in the urine chiefly in the case of the crystalline preparations; the fecal excretion was never more than 25 per cent of the total, usually 10 to 15 per cent.

Gold sodium thiomalate and gold sodium thiosulfate injected in amounts supplying equivalent amounts of gold result in similar plasma concentrations and excretion of gold. The plasma concentration and the excretion of gold vary with the size of the weekly dose but are usually not directly proportional to it. Except for the immediately higher blood gold values, intravenous administration of gold sodium thiosulfate gives results similar to the intramuscular injections.

When colloidal gold sulfide is administered, the plasma values and the excretion of gold vary in the different patients; most patients have low plasma gold concentrations and excrete but little gold even though colloidal gold sulfide is given in amounts providing much more gold than is supplied in the crystalline salts studied. These observations were clearly shown to be the result of quick phagocytosis of the gold particles getting into the circulation, and probably also the slower and less complete absorption from muscle or intestinal tract. The lower toxicity reported for this drug (and found by us) and our finding of much less frequent benefit seems inevitable in the light of these metabolic data.

Gold given as the sodium thiomalate or as sodium thiosulfate is retained in large amounts and is eliminated slowly. The amount of retention during treatment, the length of time gold is eliminated after administration correspond largely to the speed and amount of administration—the size of the weekly injection. Late toxic reactions were much more severe and frequent in patients receiving larger weekly injections of gold in a crystalline salt. Considering this fact in the light of the metabolism data, it would appear that many toxic reactions result from retention of gold in amounts sufficient to poison the patient and that such toxicity can be prevented by giving smaller doses of gold.

Gold is not concentrated in synovial fluid; it is present in joint fluid in an amount equivalent to, or less than, exists in plasma.

It is hoped that, with further pursuit of such investigations, gold therapy may be placed on a sound scientific basis and that, if its value is upheld, laboratory controlled methods of administration may be developed so that this therapy will become dependable and safe.

Bacteriostatic Action of Serum of Rheumatoid Arthritis Patients Treated with Gold Salts

DR. EDWARD F. HARTUNG, New York: Evidence is accumulating that the administration of gold salts will occasionally arrest the activity of rheumatoid arthritis. It is therefore natural to seek an explanation of the mode of action of this type of therapy. On the assumption that rheumatoid arthritis is a disorder of infectious etiology, I was interested to see if the blood was more or less bacteriostatic *in vitro* following the parenteral administration of various gold salts and colloidal preparations of gold. The bacteriostasis following administration of bismuth subsalicylate also was studied.

Since the hypothesized infectious agent of rheumatoid arthritis is unknown, other common laboratory organisms were used, most frequently a beta hemolytic streptococcus isolated from an acute mastoid infection. I do not feel, however, that the hemolytic streptococcus has been shown to be causally related to rheumatoid arthritis.

Related questions also were studied, such as the bacteriostasis of gold salts *in vitro* in varying dilutions and the determination of the agglutinin titers for hemolytic streptococcus before and after administration of gold salts.

The technic used in the determination of the bacteriostatic power of the serum was a slight modification of the method commonly used in this type of study. Measured amounts of culture were mixed with varying dilutions of serum, and after incubation the material was plated and colony counts made.

Subcutaneous injections of gold sodium thiomalate administered to rheumatoid arthritis patients in divided doses totaling as little as 60 mg. and up to 921 mg. were followed by a decided increase in the bacteriostatic power of the serum against the hemolytic streptococcus. The observed bacteriostatic effects were in rough proportion to the total amount of gold sodium thiomalate given, the maximum effect being attained after from 147 to 155 mg. had been administered. The bacteriostasis disappeared after stopping the administration for three to six months. The administration of gold sodium thiosulfate and "aurothioglucose" was also followed by a decided increase in the bacteriostatic power of the serum against the hemolytic streptococcus.

Parenteral injections of gold sodium thiomalate did not significantly increase or decrease the agglutinin titers for the hemolytic streptococcus. Colloidal gold in the amounts administered did not produce significant bacteriostasis. Bismuth subsalicylate was hardly more effective.

Gold sodium thiomalate was found to be bactericidal *in vitro* against a streptococcus hemolyticus in dilutions through 0.000001 per cent and bacteriostatic in higher dilutions. Other common laboratory organisms were similarly though not as strongly affected. The *in vitro* bacteriostasis was roughly proportional to the concentration of gold salt.

DISCUSSION ON GOLD THERAPY

DR. M. HENRY DAWSON, New York: Three or four years ago in discussing a paper I expressed the opinion that a therapeutic agent with such a degree of toxicity as gold should be used with the utmost caution; indeed, that perhaps its use was not justified at all. Since then the dangers of chrysotherapy have been reduced and it is now the general feeling among those who have had the most experience that gold salts constitute a valuable aid in the treatment of rheumatoid arthritis. Indeed, the value of gold salts is now so generally recognized that every effort is being made to develop less toxic compounds and to eliminate the unfavorable reactions. In studying the use of gold salts experimentally it is necessary to proceed indirectly because we do not yet know the cause of the disease. Therefore we have had papers dealing with gold salts in hemolytic streptococcus infections and in diseases due to pleuropneumonia-like organisms. Dr. Rothbard has stated that no favorable effect was observed in treating hemolytic streptococcus infections with gold sodium thiomalate after the disease was well established. This may well be due to the large amount of infecting culture employed. I believe that if small doses had been used a curative effect might well have been demonstrated. If Dr. Sabin's interesting results can be transferred to the clinic it would appear that he has made a significant contribution to the therapy of rheumatoid arthritis. However, I am sure that Dr. Sabin fully recognizes that many of the toxic reactions encountered with gold are hypersensitive in nature rather than heavy metal poisoning. Other means may have to be found to eliminate this type of reaction. In regard to calcium gold salts I believe there is one product available now, called myoral. I wonder if there is any information available concerning its toxicity or effectiveness? Dr. Sabin's calcium salt is now being tested out in several clinics and the reports will be eagerly awaited. It is interesting that Dr. Freyberg finds that gold continues to be excreted for eleven to thirteen months after the last injection. This is an important observation. I have observed 1 patient in whom nephrosis developed eleven months after the discontinuance of chrysotherapy. One cannot be sure that the nephrosis was due to the gold, but in view of Dr. Freyberg's report it would seem entirely possible. I have observed another patient who developed exfoliative dermatitis eight months after the last injection of gold. So one must be constantly on the watch for late toxic effects. I should like to ask whether the degree of bacteriostasis reported by Dr. Hartung is related to the amount of gold administered or to the blood level of the gold. Finally I should like to make one observation which is contrary to the findings reported by Dr. Hartung; namely, the effect of chrysotherapy on the hemo-

lytic streptococcus agglutination phenomenon. In my experience this reaction, once established in rheumatoid arthritis, rarely becomes negative. However, since the introduction of chrysotherapy I have noted a change in the capacity of the patients' serum to agglutinate hemolytic streptococci in a fair number of instances. This change has occurred in many cases which responded particularly well to treatment. The significance of this change remains to be evaluated. The reports this morning have all been concerned with laboratory investigations. It is obvious that continued clinical trial with gold salts is required before their value can be properly gaged. In the meantime I do not feel that it is a form of treatment which should be used by any but the most careful of physicians—preferably those who have had experience in its use.

DR. RUSSELL L. CECIL, New York: The impression prevails that experimental streptococcal arthritis is an acute pyogenic disease. It can be. It was produced by Dr. Rothbard with streptococci of all degrees of virulence. However, it can also be a progressive disease going on to chronic proliferative changes in the same way as the arthritis produced by the pleuropneumonia-like organism. Large doses of a highly virulent strain will always produce an acute arthritis. I do not know what Dr. Sabin means by progressive arthritis. Is it progressive for some time after the original inoculation? I see in experimental arthritis in rabbits and rats, the two animals with which I have chiefly worked, a streptococcal bacteremia after the injection, which sometimes persists for days or even several weeks, but one never gets new joint involvement in the animals after the bacteremia has disappeared. Streptococcal arthritis, while it is progressive so far as internal damage is concerned, is not progressive in the sense that new joints develop spontaneously. I would like to ask Dr. Sabin whether he can inform me on that point. Dr. Sabin spoke of a time and dose factor. That agrees with human experience. In studies with gold therapy on the human being I find that the results are better in the early cases than in the late ones. I also believe that there is a factor in dosage which is important; in other words, I like to give as large a dose as possible. I do not believe we can standardize our dosage in treating the human type of arthritis but I think we should give as much as is safe. With a big athlete I will feel more courageous than I would with a little spinster weighing 90 to 100 pounds. I wish I could believe that with 25 to 50 mg. once a week we are doing the patients as much good as with large doses. Unfortunately, from my experience that is not the case. Another point on which I have to digress a little from the speakers, and Dr. Freyberg particularly, is in the development of exfoliative dermatitis. In my experience exfoliative dermatitis has frequently come early in the disease while the dosage is still small, in other words, in highly susceptible people. If the patient gets over the first phase of gold therapy I feel comparatively safe.

DR. R. GARFIELD SNYDER, New York: It seems strange that of two university research departments the Cincinnati group says that it can cure 94 per cent of arthritis in mice if treatment is instituted within one week after the appearance of the first symptoms, while on the other hand the Cornell group says it was not able to obtain any cures after the arthritis was once established. The discrepancy of the results obtained as regards cures might be explained by the fact that the Cornell group does not state the time period which elapsed after the first appearance of the symptoms and the time it instituted treatment. Perhaps if it had started treatment within the first week its results would closely parallel Dr. Sabin's. Dr. Sabin brings up the question of instituting gold therapy within the first week after the appearance of symptoms. This should be tried out in a large series of cases to see if complete cures could not be obtained in a relatively large proportion of these cases. Dr. Freyberg's delicate and practical test for the presence of gold in the urine, feces and blood will probably be of great value in the future, because by using it extensively we may be able to develop a fairly accurate idea as to what is the minimum amount of gold we must have in the blood to be effective and also the maximum amount of gold a patient can tolerate in the

blood without getting toxic symptoms. We have had two main objects in view at the Hospital for the Ruptured and Crippled: to see whether gold really is as effective as claimed and to see if by an excessive amount of care in its administration we could reduce the reported percentage of toxicity. While the current reports in Europe and this country in regard to toxicity range between 30 and 40 per cent, we succeeded in reducing our toxicity to 17 per cent. While European reports indicate 6 per cent serious toxic results, we have had only 3 per cent. An effort has been made to supply the medical profession with a gold preparation that is not toxic. The only one of this type on the market at the present time is Aurol-Sulfide. This salt has been used in several research clinics during the past year and a half, but the results to date are inconclusive. It is definitely less toxic than any other form of gold therapy, but unfortunately the clinical results obtained have not been very satisfactory up to the present time. Much more research must be done on the question of Aurol-Sulfide before any definite conclusions can be drawn with regard to the clinical value and effectiveness of this drug.

DR. J. ALBERT KEY, St. Louis: It is interesting that, with two types of disease, in one of them the gold cures the disease after it has started in experimental animals, and in the other it will prevent the development of the disease if given soon enough after the organisms are injected. How closely related these diseases are to rheumatoid arthritis we at present do not know. I agree with Dr. Cecil in emphasizing the fact that chronic arthritis is a disease in which the organism invades the joint and does a variable amount of damage and then invades other joints, but it does not move out of the first joint. When we speak of a cure of arthritis we must remember that the joint does not regenerate. If one is going to save the joint, it must be saved before the damage is done. Regarding the danger from gold, in the paper we presented four years ago we had 80 patients. We had four serious reactions with no deaths. Since that time we have had no serious reactions in the clinic. Dr. Rosenfeld had one serious case of purpura in a private patient who recovered. I do not give gold in my office, because I do not think a man should give gold unless he is willing to examine the blood and urine of his patients at frequent intervals. On the other hand, I think it is a safe drug to give. With a dose of 50 mg. of gold sodium thiomalate or 25 mg. of gold once a week the danger of serious reactions is decreased. I am interested to hear that Dr. Freyberg has shown that large doses of gold are not necessary for clinical results; in other words, if one can keep the gold in the plasma up to the optimal level, and that level will have to be determined by a lot of clinical observation followed by laboratory checks, that is all that is necessary. That will make the use of toxic material relatively safe. If nontoxic gold salts prove to be effective clinically, that will be a further boon. I wonder if Dr. Freyberg in his experimental animals found out where this gold that was retained was stored. I would expect it to be in the bone. In fact, it might be released by something that would lower the hydrogen ion concentration and might cause toxic symptoms later. I am much interested in the fact that gold has a bacteriostatic action similar to that of sulfanilamide and sulfathiazole. These also are toxic drugs and we use them. Clinically with gold we get a stasis of the disease more often than a cure; then the disease may recur. It seems to me that this bacteriostatic effect may point the way to the manner in which gold acts in the human being.

DR. CHARLES W. WAINWRIGHT, Baltimore: We have been using gold in Baltimore at the Johns Hopkins Hospital for the past year and a half. We have been convinced that gold is effective in bringing about a remission in chronic rheumatoid arthritis. The improvement noted has in our experience fallen into a pattern with sufficient regularity to take it beyond the realm of coincidence with spontaneous remission. Lessening of pain in the joint has been the first improvement noted, and objective changes have followed. With the first course of gold we have experienced a large percentage of minor toxic effects, as I think every one has who has used it. We have used only

gold sodium thiomalate and have started with small doses, increasing gradually to a dose of 100 mg., Dr. Freyberg's "conventional dose." We have not been able to determine blood levels and urinary and fecal excretion. However, our clinical impression has been that smaller amounts of gold are probably quite as effective as the larger ones, and if not as effective certainly much more safe. We have been rather disappointed in the fact that the use of gold has not seemed to influence at all the tendency of rheumatoid arthritis to relapse. Hence I speak of the ability of gold to bring about a remission in the disease. As a matter of fact, we have felt that probably the relapses occurred a little more often or sooner than those which followed a spontaneous remission. Of course it is highly desirable to know what is the optimum blood level and perhaps even to maintain it if it can be done without intoxication.

DR. CHARLES L. SHORT, Boston: Rheumatoid arthritis is a difficult disease in which to evaluate therapy. There are spontaneous remissions even in cases that seem far advanced. My own experience has been small, but the cases I have treated have either been progressive or in a steady state for a year or more. I have treated 26, and of these, as far as I have followed them, I can really say that there has been definite therapeutic effect on only 4. I do not believe that this is more than one might get in the ordinary patient with rheumatoid arthritis under general treatment. I have used both gold sodium thiomalate and a compound called Neosolganol and have tried to give all these patients two full courses with the conventional doses. Over half of the patients suffered toxic reactions of one type or another, but fortunately only 1 has had a serious reaction—an exfoliative dermatitis. There have been 2 cases of severe herpes zoster, 1 involving the fifth nerve but fortunately not the eye. More carefully controlled clinical observations are needed before we can say that gold as used at present is of "undoubted value" in the treatment of rheumatoid arthritis.

DR. H. M. MARGOLIS, Pittsburgh: In the past few years my associates and I have used gold salts in the treatment of approximately 85 patients with rheumatoid arthritis. I do not think there is any question about the value of this drug when employed in conjunction with other necessary systemic measures in a well coordinated medical regimen. It is well not to underestimate the value of general systemic measures that are essential in addition to chrysotherapy. I have had the opportunity of observing patients who had been given injections of gold salts alone without much, if any, improvement. Yet these patients eventually got well when gold salts were used in conjunction with other general measures. That is not surprising, for a patient with painful, swollen joints who is undernourished, tired and anemic needs more than an injection of gold salts once a week. I am also convinced that patients treated in the early phases of the disease get better results than those treated late. Since some clinics still reserve gold therapy for the most advanced and refractory cases, reports of their results are apt to be more discouraging than if the drug had been administered in cases more amenable to such treatment. In evaluating the effectiveness of gold salt therapy in arthritis, it is well to note whether such patients had been given gold as a part of the initial therapeutic regimen or only after all other measures had been exhausted. It is to be remembered that gold salts appear to influence chiefly the exudative, periarticular changes; cartilage and bony changes are less amenable to the effect of this drug. In our first 50 patients we had approximately 40 per cent of mild reactions: mild pruritus, minor cutaneous reactions, stomatitis with aphthous ulcers in the mouth. Later we noted some of the more severe and more serious reactions. Two patients had severe leukopenia with reduction in the percentage of neutrophils. These developed during the early phases of their treatment with gold. They recovered when administration of gold was stopped. Had we not become aware of the neutropenia through weekly white cell counts checked before each injection, we might have induced a serious, and perhaps fatal, agranulocytosis. We have seen 2 cases of severe, generalized, eczematoid dermatitis apparently precipitated by gold. We have seen 2 cases of nephrosis characterized by severe albu-

minuria, without edema; otherwise, clinical evidence of renal irritation has been surprisingly absent. It seems that, if one treats enough patients with gold, one is bound to see reactions sooner or later. And small doses do not insure against reactions, even severe ones. The instance of most severe dermatitis and the only example of serious hepatitis occurred in patients who had had a little over 200 mg. of gold, given in small individual doses, distributed over a period of months. Consequently, I wonder whether the individual dose of gold, or the total amount administered, or the amount retained in the body plays much of a part in determining the incidence and severity of reactions. I have an impression that these reactions are conditioned more by idiosyncrasy than anything else.

DR. WILLIAM K. ISHMAEL, Oklahoma City: Could the beneficial effect from gold therapy in arthritis be the result of the damaging effect of this metal on the liver? In connection with Dr. Rothbard's report on the elevation of the nonprotein nitrogen in his cases, I have observed on several occasions that striking results were obtained when the patient had a "toxic" reaction from the gold therapy.

DR. JOHN W. GRAY, Newark, N. J.: In the enthusiasm for the beneficial effects of gold salts we should not fail to emphasize its dangers repeatedly. Some physicians are afraid to give gold at all, while others give it in maximum doses without testing for idiosyncrasy and without repeated tests for toxicity. I have given gold treatment in nearly 200 cases, and about one-fifth of them showed sufficient evidence of toxicity for discontinuance of the drug. Renal complications occurred most frequently and, although the presence of casts in the urine is not as dramatic a reaction as the development of purpura, acute agranulocytosis or exfoliating dermatitis, it may prove to be just as serious unless the drug is discontinued when such evidence of renal irritation occurs.

DR. DARRELL C. CRAIN JR., Washington, D. C.: I should like to ask what success has been achieved in preventing complications. I have started the rule of administering some vitamin K with gold salts on the empirical basis that it may stop the purpuric reactions. Although 35 patients is too small a number on which to judge, not one of them has had purpuric reactions. Two patients had rather severe cutaneous reactions which were controlled by large doses of vitamins B and C. They were given large doses of thiamine (usually 50 mg.) and 20 mg. of ascorbic acid and large doses of nicotinic acid (usually 250 mg.) all in one day, and both improved.

DR. CURRIER McEWEN, New York: In speaking of the hemolytic streptococcus agglutination reaction, Dr. Dawson mentioned that he has seen positive reactions change to negative as patients improved. I have noticed the same thing in a number of patients followed over a period of years. One of Dr. Hartung's slides showed a number of positive hemolytic streptococcus agglutination reactions with serums from normal individuals. In my experience I have never had a titer above 1 to 20 with normal serum, and even that low titer is extremely rare. I wonder, therefore, if some technical reason does not account for the lack of correlation shown in Dr. Hartung's slide.

DR. WALTER BAUER, Boston: Would Dr. Sabin describe the clinical course of untreated pleuropneumonia arthritis? Can Dr. Freyberg tell whether the injected gold can be mobilized by the methods commonly employed in the case of other heavy metals such as lead?

DR. CORNELIUS H. TRAEGER, New York: I have used various types of gold therapy for the past six years and know its potential dangers. I want to caution against the indiscriminate use of gold therapy in early cases by those inexperienced in its use. Excessive enthusiasm for this drug in early cases must inevitably be followed by a wave of untoward reactions which might easily bring unmerited discredit to this type of therapy. This would be lamentable since it has a definite place in the therapeutic armamentarium of the physician treating arthritis. Only in the skilled hands of the physician who surrounds himself with all the proper safeguards is gold therapy in early

cases of arthritis advisable. Physicians unfamiliar with its use would do well to apply the more conservative measures which were used with some success before the advent of gold therapy. Until such time as newer and less toxic forms of gold are developed, let us be extremely cautious. I should like to take exception to one statement that was made: that continued therapy with gold increases the toxic results. That has not been my experience. I have used gold for nearly six years in hundreds of cases, and the longer I use it the less frequent are the toxic reactions.

DR. PHILIP S. HENCH, Rochester, Minn.: May I comment on Dr. Ishmael's question as to whether the effect of gold salts is produced via the liver? Among the 900 arthritis patients treated with gold by Hartfall, Garland and Goldie in 1937 almost 10 per cent (85) contracted jaundice presumably of the catarrhal type from toxic hepatitis. If so many patients had hepatitis to the point of actual jaundice one can only wonder how many others may have had a mild hepatitis insufficient to induce jaundice. It would appear, at least, that during chrysotherapy the liver is not uncommonly affected in varying degrees. Hartfall, Garland and Goldie noted no ameliorating effect of the "gold jaundice" on the arthritic symptoms, but unfortunately we do not know the exact intensity or character of the jaundice in their cases, as the concentration of bilirubin and the van den Bergh reactions were not reported. Those who attended the International Congress on Rheumatism and Hydrology in London in 1938 may recall that Dr. Schlesinger demonstrated at the Great Ormond Street Hospital a little boy who had had severe rheumatoid arthritis. He was given chrysotherapy with excellent results so that without apparent pain or notable discomfort he ran around the room for us. In the discussion of this case it came out that the child had had severe gold hepatitis and jaundice, prior to which the effect of gold had not been striking but during which the child had rapidly and remarkably improved. Further evidence that the hepatitis and jaundice incident to chrysotherapy may invoke a dramatic remission of symptoms of rheumatoid arthritis is available. McFadzean of England wrote me about a woman with "acute rheumatoid arthritis" treated with gold. After three injections jaundice developed: "Within a week she had lost all the symptoms of rheumatoid arthritis and now six weeks after the onset of jaundice she is still absolutely free and doing the housework comfortably." Cecil recently (1940) reported that one of his patients who had "typical rheumatoid arthritis of four years' duration" developed toxic hepatitis with jaundice about eight weeks after the final (tenth) injection of sanocrysin. Prior to the onset of jaundice and despite the amount of treatment up to that time, she had considerable arthritis in various joints with swollen wrists and ankles, several fusiform fingers and swelling of the right knee. The jaundice lasted four to five weeks. "Within a week or so after the onset of jaundice, the swelling and pain disappeared entirely from her joints and there was complete restoration of function." This period of relief lasted three months; then her articular symptoms gradually returned. In most cases when gold is effective the results appear without jaundice and they appear gradually, not suddenly. In view of the more dramatic effect that may occur when actual gold hepatitis and jaundice occur, one wonders whether the liver may not be partly responsible also in those cases in which a less dramatic relief appears without jaundice. It has recently been reported that in normal animals gold is deposited in the parenchymal cells of many organs (especially the liver, spleen, kidneys and bone marrow), but in animals with chronic infections gold is deposited almost entirely in the cells of the reticuloendothelial system. We cannot state that chrysotherapy produces its effects by invoking the same phenomenon which occurs when spontaneous jaundice of various sorts relieves the symptoms of rheumatoid arthritis. But it would be of interest for investigators of chrysotherapy to study the effects of such therapy on the livers both of patients who are relieved and in those not relieved by injections of gold salts.

DR. SIDNEY ROTHBARD, New York: Dr. Dawson thought the amount of *Streptococcus hemolyticus* culture used to induce the arthritis in rats was too large and that because of this the

gold would not cure the disease. This seems unlikely, since gold was effective in preventing the arthritis when rats were infected with similar amounts of culture. Moreover, the animals were not treated with the gold compound until seven days had elapsed after the onset of arthritis. At this time streptococci were not found in the blood stream or the synovial fluid of the involved joints. If smaller amounts than 0.5 cc. of culture are used, an insufficient number of animals develop the disease for curative experiments. Dr. Ishmael suggested that liver injury may explain why the rats with arthritis failed to respond to the gold therapy. Microscopic study of the livers of many of the experimental animals did not show any lesions other than a slight cloudy swelling of the hepatic cells. The third point raised was whether any studies had been performed to prevent the renal injury observed in these experiments. No investigations of this nature were made in our study.

DR. ALBERT B. SABIN, Cincinnati: The question raised by Dr. Dawson regarding the nature of toxicity of gold compounds has an important bearing on the relationship between the toxic manifestations observed in laboratory animals and those exhibited by human beings. It is our impression that our tests in laboratory animals measure only the "protoplasmic poison" effect of these compounds, while at least some of the toxic manifestations in man may be due to sensitization or other factors which are not reflected in determinations of the minimum lethal dose of a compound. Therefore, until we have some method of comparing the relative sensitizing capacities, if any, of various gold compounds in animals, we are limited in our experimental studies to determining whether one compound is more or less lethal than another, and only suitable clinical trial can indicate the effects of any compound in human beings. Dr. Cecil inquired as to what we meant when we used the word progressive with reference to the experimental arthritis, and Dr. Bauer asked me to say a little more about the clinical picture of the experimental disease. The experimental arthritis is produced by a single intravenous injection of the type B mouse pleuropneumonia micro-organism. Within twenty-four hours and thereafter the micro-organism can no longer be detected in the blood stream or in any of the viscera by suitable cultural methods. The available evidence indicates that this particular micro-organism has an affinity limited largely to the articular tissues, in which it appears to behave like an obligate intracellular parasite. Clinically the first signs of arthritis may begin as early as four to seven days after injection. The anterior and posterior extremities are equally affected, and fusiform swelling of isolated digits associated with involvement of the metacarpophalangeal or metatarsophalangeal joints is common. The joints are at first swollen and red but gradually lose this acute look and appear thickened and enlarged. The arthritis is migratory, new joints becoming involved while others recede. Thus the arthritis may disappear spontaneously from some of the joints, while in a certain number of others in the same animal it is progressive in that the joints continue to increase in size and after a variable period (two to six months) go on to deformity and ankylosis with associated atrophy of the neighboring muscles. It is of interest that new joints may become involved as late as five to six weeks after a single injection. Whether the organisms localize in all joints at once, the arthritis developing in them at different times, or whether there is a migration of organisms from affected joints to others in the body, we do not know except that cultures of the blood and viscera are regularly negative. The experimental disease is thus progressive in two respects: (1) the continued involvement of new joints over a period of weeks and (2) the continued activity of the pathologic process in some of the joints until ankylosis or deformity or both have supervened. Except for the arthritis, the mice appear to be in good health. The pathologic changes during the first week appear to be limited to the synovia, which undergoes proliferation, to the capsule, which exhibits a mild inflammatory reaction and proliferation of fibroblasts, and the joint space, which contains an increased amount of mucin and a slight cellular exudate consisting of almost equal numbers of polymorphonuclear and mononuclear

cells; during the second and third weeks there is evidence of beginning change in the cartilage with proliferation of the perichondrial cells, and at the end of four weeks in the joint with progressive arthritis one may already see a distorted articulating cartilage exhibiting necrosis in some areas and proliferation in others, with thickening of the synovia and capsule, in which foci of fibrinoid necrosis are present; at this time one also finds a proliferative reaction in the subchondral bone marrow and beginning obliteration of the free joint space. One may perhaps note some of the essential differences between this experimental disease and the streptococcic arthritis in rats described by Drs. Rothbard, Angevine and Cecil. The latter is for the most part not progressive and is self limited to such an extent that it would indeed be difficult to evaluate the possible curative effect of any compound on it. The essentially prophylactic effect of sodium aurothiomalate on the streptococcic arthritis is related to the bactericidal effect of gold on the streptococcus rather than to any effect on the established pathologic process. To be contrasted with this is the fact that sodium aurothiomalate has no demonstrable effect on the type B pleuropneumonia organism, the etiologic agent of the experimental disease in mice. As a matter of fact this micro-organism can be grown for several generations in the presence of therapeutically adequate amounts of gold and still produce arthritis. Whether or not the successful curative effect of this and other gold compounds on the fully developed arthritis in mice is due to an effect on the pathologic process or on the susceptible cells in which the etiologic agent has to multiply remains unknown. Dr. Key's remarks about the therapeutic effect of gold compounds in human arthritis occurring predominantly before extensive damage to the articulating cartilage has taken place is in agreement with our observations on the therapy of the experimental disease in mice. Dr. Wainwright's remarks regarding the relatively frequent occurrence of relapses that he and others have observed among patients treated with gold salts are of interest in relation to the effect of various doses of gold in the treatment of the experimental mouse arthritis. When doses of gold which are well above the minimal effective range are used, the arthritis disappears in nearly 100 per cent of mice and relapses are extremely rare. However, with doses in the minimal effective range (i. e. a range in which the arthritis disappears in only 50 per cent of mice) or below it, the incidence of relapses may be higher than 50 per cent (i. e. the arthritis recurs spontaneously in animals in which it had completely disappeared). One may therefore perhaps be justified in wondering whether the dosage commonly used in human beings may not, from a therapeutic standpoint, be in the minimal or subminimal range.

DR. R. H. FREYBERG, Ann Arbor, Mich.: Whether the benefits attributed to gold salts are peculiar to gold or whether they may result from salts of other metals requires further study. It must be emphasized that calcium aurothiomalate has not yet been studied sufficiently in human beings to make any statement regarding its value in the treatment of rheumatoid arthritis. We recognize that the tissue concentration of gold may have more significance than the plasma concentration. However, it is difficult or impossible to measure the gold concentration in various human tissues. It can be measured in the blood. We are therefore trying to determine what value the plasma concentration has in guiding therapy. I feel that the nephrotoxic effects of gold preparations have not been sufficiently emphasized in the literature. We have seen some nephrotoxic effects and we are afraid of them. Dr. Dawson asked why we felt that the smaller doses of gold salts which result in a smaller retention of gold may be less harmful. In our experience to the present time all serious toxic reactions have occurred toward the end of therapy or after treatment had been stopped, and all occurred in patients who had received weekly injections of 100 mg. of gold sodium thiomalate or a comparable amount of gold. With smaller doses, although reactions occur, so far, no severe dermatitis or nephritis has been experienced. In the light of the metabolic data, showing that there is a greater retention of gold in persons to whom larger amounts of gold were given, should reactions occur in those patients, it is reasonable that they may be more severe

and continue longer—for gold is present in the body in greater amounts and for a longer time. If as good therapeutic results can be obtained with small doses for these reasons, we feel that they should be used. In our experience thus far we have had as good results with smaller doses as with the larger, conventional doses. We have tested the cutaneous reaction to find out whether it would indicate persons who are "sensitive" to the drug. Such studies so far have been of no value. We hoped to learn whether differences in metabolism and excretion of gold accounted for (1) the therapeutic failures which occur all too frequently and (2) some or all toxic reactions to gold preparations. Such metabolic studies require a lot of time. The number of patients who can be studied thoroughly is comparatively small each year. To correlate toxic reactions and therapeutic effects with metabolic data in a sufficiently large group of patients in order to determine whether laboratory measures will control therapy will require more time. Dr. Key asked where gold is stored. We have studied a number of animals in an effort to answer this question. At present, final statement cannot be made. After fourteen daily injections of gold sodium thiomalate or gold sodium thiosulfate the kidneys contained the greatest amount of gold per gram of tissue, as far as the work has progressed. We have so far analyzed only the kidneys, heart, spleen, liver, the site of injection in muscles and the remainder of the carcass as a whole. We have not analyzed the bones or bone marrow separately. We have studies under way to find out whether gold is "stored" in the bone as other heavy metals are. I was glad that Dr. Wainwright emphasized that relapses occur after gold therapy. We have observed them after some of our best therapeutic results. I am also pleased that Dr. Short emphasized that not all patients are benefited by gold therapy. We have treated many who have shown no benefit. This perplexes me. Why are some patients benefited and others in apparently the same stage of the disease not? We hope we might answer that question by observation of the metabolism of gold to learn what different factors exist in different patients. I agree with Dr. Margolis that all gold can be expected to do is to check the inflammatory process. It certainly cannot rebuild damaged joints! I cannot answer Dr. Bauer's question as to how gold may be mobilized. That problem needs much more study. Little is known about the disease we are treating with gold preparations, and little was known about gold. We thought we could eliminate much or all of this second "unknown." If a certain minimum content of gold is necessary in the tissues to effect benefit, and if this amount is indicated by serum concentration or excretion studies, we should be able to learn this. Also if toxicity results from excesses of gold, serum or excretion studies should allow us to prevent such excesses. So it may be that laboratory methods may allow us to regulate gold therapy as potassium thiocyanate and sulfonamide drug therapy can now be regulated, making therapeutic effects more certain and toxic reactions less frequent and less severe.

DR. E. F. HARTUNG, New York: There are two questions I should like to answer, and I cannot answer either one satisfactorily. What is the correlation between gold levels on the serum of the blood and bacteriostasis? We started to use a method for quantitative analysis of gold and we soon found that it was applicable to urine but not to serum. It can be used quantitatively, but those quantitative results are not relative. In passing, I might say that our results on the analysis of gold in the urine are satisfactory. We got results similar to Dr. Freyberg's. I cannot state the correlation of gold in the urine with bacteriostasis. Bacteriostasis rapidly reaches the maximum after 60 or 80 mg. has been given and does not increase if a gram has been given. This bacteriostasis, when it becomes maximum, is not related to the interval between the last dose and the time the specimen is taken. Apparently from Dr. Freyberg's work the plasma levels are increasing or decreasing with each dose but the bacteriostasis is relatively constant because it appears at a relatively lower level of serum content of gold.

(To be continued)

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

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Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

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Attempt to Correct Asymmetry in Leg Length by Roentgen Irradiation: Preliminary Report. W. S. Judy, Greenville, S. C.—p. 237.
Roentgenologic Report of Chest Examinations. H. E. Ashbury, Baltimore.—p. 241.

Polyostotic Fibrous Dysplasia.—Kornblum reports 2 cases of polyostotic dysplasia which emphasize that, although its diagnosis can be suspected from the clinical and roentgen manifestations, confirmation depends on microscopic study of bone. The disease is primarily one of childhood, but because of the protracted course the condition is not encountered until adolescence or adult life. Pain, limp and deformity of one lower extremity are the usual clinical features. The onset of symptoms is insidious; pain and disability are slowly progressive, and deformity usually becomes manifest at the height of the disease during adolescence or early adult life. The disease is apparently never fatal and never cured. It becomes less active with increasing age. The most striking feature of it is the rather typical roentgen appearance of osteitis fibrosa. Apparently no bones are exempt, although those of the lower extremities are more frequently affected. With an increase in the size of the lesions there is a thinning of the cortex of the bone,

which eventually may expand slightly. Functional activity of the weakened bones causes deformities to develop. Loss of bone substance and thinning of the cortex predispose to pathologic fractures. With increasing age the lesions tend to retard but never actually disappear. In polyostotic fibrous dysplasia the serum calcium level may be normal or even slightly elevated but never as high as in hyperparathyroidism. There is no significant change in the serum phosphorus. The phosphatase content of the blood is moderately increased. Patients on low calcium diets excrete normal amounts of calcium in the urine. Positive differentiation from hyperparathyroidism depends on the microscopic study of bone, in which the following should be observed: a thinning of the cortex, a replacement of the marrow and spongiosa by dense, gritty, rubbery fibrous tissue interspersed with poorly calcified bone spicules and an absence of cyst formation. An exploratory operation for a parathyroid tumor is not justified until the clinical, roentgen, chemical and microscopic features of the disease have been investigated thoroughly and found lacking.

Archives of Pathology, Chicago

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- Calcification and Ossification: Mobilization of Bone Salt by Parathyroid Extract. F. C. McLean and W. Blood, Chicago.—p. 315.
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- *Studies on Experimental Hypertension. H. Goldblatt, J. R. Kahn, Cleveland, and H. A. Lewis, Los Angeles.—p. 327.
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Venous Thrombosis: Early Diagnosis with Aid of Phlebography and Abortive Treatment with Heparin. G. Bauer, Mariestad, Sweden.—p. 462.
Congenital Lumbosacral Defect. J. G. Sinclair, N. Duren and J. C. Rude, Galveston, Texas.—p. 473.

Experimental Hypertension.—Goldblatt and his associates report experiments on dogs which may prove of value in solving the clinical problem of whether unilateral nephrectomy should be performed in order to lower the blood pressure in some clinical cases of hypertension in which one kidney is obviously diseased and probably ischemic. On the basis of their data they say that lowering of the blood pressure should not be expected to follow excision of a completely nonfunctioning

kidney whose lack of function is due to occlusion of the ureter, even though clinically there is some indication that such a kidney may still be responsible for the hypertensive effect. Under such circumstances, at least for the present, it is probably best to perform nephrectomy only if the obviously diseased kidney is the source of other untoward clinical effects (infection or persistent pain) for which removal might in any event be indicated. Nephrectomy should be done mainly to remove the diseased organ rather than for the possible cure of the hypertension. In contemplating unilateral nephrectomy it is desirable to determine as far as possible that the other kidney is normal, before the obviously diseased, though still functioning, kidney is removed for the possible favorable effect that the procedure may have on the elevated blood pressure.

Unilateral Nevus.—According to Pack and Sunderland, only 4 cases of neuropathic papilloma or naevus unius lateris were observed among 40,000 patients with neoplasms studied at the Memorial Hospital. With the 156 reported in the literature, these make 160. The peculiar linear unilateral distribution is not limited to nevi of the verrucous or papillary type, and the nevus may involve any of the components of the skin. The authors believe that such nevi form a clinical entity sufficiently characteristic to deserve individual classification. Lesions of the trunk are usually arranged in a transverse manner and those of the extremities in longitudinal or spiral streaks. However, there is no one characteristic pattern of distribution. Only one third of the tumors show any relation to nerve distribution. Rarely is there any evidence of a hereditary factor. Almost half of the lesions appear at or shortly after birth and most of the remainder in early life. More than two thirds of the nevi are pigmented. Microscopic examination reveals chiefly hyperkeratosis, distorted epidermis and elongated papillas. Subjective symptoms, if they occur, are itching or irritation. Many forms of treatment have been employed, with varying degrees of success. The authors believe that surgical excision of the entire thickness of the involved epidermis is the method of choice. The cause of the condition remains unknown, but the trophic influence of nerves cannot be excluded as a pathogenic factor. The pathologic process appears to be located solely in the epidermis. The occurrence of various congenital skeletal malformations and nervous disorders appear to be more frequent in persons with naevus unius lateris than in those unaffected, but the possibility of mere coincidence cannot be discarded. Three of the authors' 4 patients died of cancer, in 1 multiple basal cell carcinomas developed in the nevus (the axillary nodes were involved by epidermoid carcinoma, presumably metastatic from some undetected primary epidermoid cancer in the papillary nevus, this patient dying of pulmonary metastases), 1 patient died at the age of 23 from pulmonary metastases of carcinoma of the breast which had been covered with nevi and heavily irradiated and 1 patient died of carcinoma of the esophagus and stomach at the age of 43. However, in this patient there is little basis on which to assume more than coincidental occurrence of the nevus and the carcinoma.

Hyperthyroidism and Adenocarcinoma of Thyroid.—Friedell discusses the association of hyperthyroidism with primary adenocarcinoma of the thyroid in which not only clinical variations but the coincidental presence of other benign pathologic changes in the thyroid are involved. From 1917 through 1937 there were at the Mayo Clinic 412 microscopically proved and graded (Broders' method) adenocarcinomas (primary malignant neoplasms of epithelial origin) of the thyroid. Each of the tumors was considered an adenocarcinoma despite scirrhous, papillary or malignant adenoma variations. A clinical diagnosis of hyperthyroidism was made in 57, or 13.8 per cent, of the 412 cases. All the patients were operated on. Hyperthyroidism was much more frequently associated with the lower than with the higher malignant grades of adenocarcinoma. Although a definite conclusion that adenocarcinoma of the thyroid is the source of functional hyperactivity cannot be drawn, evidence points to the possibility that the adenocarcinoma, like adenocarcinoma of other endocrine glands, at times and in part may perform the functional role of benign thyroid tissue. The inverse relation between the increase in malignant grade and decrease in hyperthyroid frequency seems especially significant. Another close relation of adenocarcinoma to hyperthyroidism

is the presence of multiple adenomas. As the malignant grade advances the frequency of multiple adenomas decreases, but about half of the adenocarcinomas (of any grade) associated with hyperthyroidism occur in thyroids containing multiple adenomas. In most cases the benign gross and microscopic changes in the thyroid will quickly eliminate the adenocarcinoma as the only possible source of thyrotoxicosis. The hypothesis that an anaplastic tumor should retain less of the normal function of its constituent cells as the degree of anaplasia advances is an attractive one and has been voiced by Ewing. Function may be a property of adenocarcinoma of the thyroid and hyperthyroidism an adjunct of it.

Arkansas Medical Society Journal, Fort Smith 38:61-78 (Aug.) 1941

- Vaccine for Epidemic Influenza: Preliminary Report. F. M. Acree, Greenville, Miss.—p. 61.
Pain and the Menstrual Cycle. J. H. Sanderlin, Little Rock.—p. 64.

Bulletin New York Academy of Medicine, New York 17:567-648 (Aug.) 1941

- Puerperal Infection: Consideration of Relationship of Pathologic Changes and Bacteriologic Findings to Prevention and Treatment. W. E. Studdiford, New York.—p. 567.
*Brucellosis. W. M. Simpson, Dayton, Ohio.—p. 592.
Dental Foci of Infection. C. G. Darlington, New York.—p. 618.
Lymphogranuloma Venereum. A. W. Grace, New York.—p. 627.

17:649-734 (Sept.) 1941

- Surgical and Nonsurgical Treatment of Prostate Gland. O. S. Lowsley, New York.—p. 651.
Infections of Mouth, Pharynx and Upper Respiratory Tract. J. D. Kernan, New York.—p. 674.
The Doctor in Court. B. L. Shientag, New York.—p. 692.
Id. G. Z. Medalie, New York.—p. 697.
Id. C. G. Heyd, New York.—p. 706.

Brucellosis.—Simpson has seen 220 patients with brucellosis. Ingestion of raw milk or unpasteurized dairy products was the source of infection and only 24 of the infections have occurred since 1931, when the universal pasteurization ordinance was passed. Each of the 24 patients was known to have consumed raw milk or its products elsewhere. Brucellosis, because it presents many symptoms and signs common to typhoid, malaria, tuberculosis and influenza, is frequently confused with these diseases. Less often the disease has been confused with acute rheumatic fever, subacute bacterial endocarditis, bronchitis, pyelitis, appendicitis, cholecystitis or tularemia. The symptoms of acute and chronic brucellosis vary greatly. The chronic ambulatory form is widely prevalent, is often confused with other diseases and is frequently not recognized. Many neuroathenic persons and patients with fever of unknown cause have been found to be victims of chronic brucellosis. Less than 10 per cent of patients with chronic brucellosis have had a previous acute febrile illness compatible with a diagnosis of acute brucellosis, which is initiated by a sharp chill and rapid elevation of temperature, often followed by a few or all of the following symptoms: tiredness, weakness, loss of appetite, constipation, headache, backache, cough, arthralgia, muscular pains, restlessness, insomnia and signs of encephalitis, myelitis or meningitis, and sometimes, in the severe instances, of vegetative endocarditis. The only procedure by which the diagnosis of brucellosis may be established is the cultivation and identification of the *Brucella* organism. Agglutination and cutaneous tests are of value in the diagnosis of acute brucellosis, but they are inadequate for the diagnosis of the chronic form. The opsonocytophagic test has also yielded inconsistent results. The test proved to be of little or no value as a diagnostic procedure or a therapeutic guide. *Brucella* vaccine therapy has produced favorable results in from 60 to 85 per cent of patients with acute or chronic brucellosis. Sulfanilamide and its derivatives are apparently of little value. Artificial fever therapy is particularly efficacious in patients who do not respond to vaccine therapy. The mortality rate is about 2 per cent. During 1936 there were 107 official reports of deaths from brucellosis in the United States. The mortality is not a true criterion of the importance of the disease. The prolonged course and the resulting chronic ill health make it a much more serious disease than the death rate indicates. Prophylaxis, that is, pasteurization

of milk and dairy products and the elimination of the disease in cattle, is the most important control measure. The campaign engaged in by the United States Department of Agriculture to eradicate brucellosis in cattle should extend to the control of the disease in hogs and goats.

California and Western Medicine, San Francisco

55:55-112 (Aug.) 1941

- Problems of Adrenal Insufficiency. R. F. Loeb, New York.—p. 61.
Surgical Lesions of Adrenal Glands. W. Walters, Rochester, Minn.—p. 64.
Medical Preparedness in California. P. K. Gilman, San Francisco.—p. 68.
Needs of the Medical Department of the Navy. E. U. Reed, San Francisco.—p. 70.
Aviation Medicine. R. G. Davis, Mare Island.—p. 71.
Needs of the Medical Corps of the Army. J. H. Schaefer, San Francisco.—p. 74.
Necessity of Yardstick in Selective Service Examinations. B. S. Thomas, Sacramento.—p. 75.
Stretching Test in Neuritis. R. Wartenberg, San Francisco.—p. 76.
Postgraduate Education in Obstetrics. W. B. Thompson, Los Angeles.—p. 79.
Cutaneous and Mucous Membrane Cancer. H. J. Templeton, Oakland.—p. 81.
Neoplasms of Reticuloendothelial Tissues. J. W. Budd, Los Angeles.—p. 84.
Regional Anesthesia with Intracain. C. F. McCuskey, Glendale.—p. 86.
William Hunter's Lectures of 1775: Two Rare San Francisco Manuscripts. J. M. D. Olmsted, Berkeley.—p. 87.
Beautification and Irrigation of Golden Gate Park with Clarified, Disinfected Sewage Effluent. J. C. Geiger, San Francisco.—p. 89.
Medical History Repeats Itself. H. E. Thelander, San Francisco.—p. 91.

Canadian Public Health Journal, Toronto

32:387-434 (Aug.) 1941

- The Health of the Nation. C. E. Dolman, Vancouver, B. C.—p. 387.
Occurrence of Diphtheria in Halifax from Oct. 1, 1940 to Jan. 31, 1941. P. S. Campbell, Halifax, N. S.—p. 404.
*Convalescent Serum in Treatment of Poliomyelitis. N. Silverthorne, W. A. Hawke and A. Brown, Toronto.—p. 410.
Schick Test in Adults. G. D. W. Cameron, Ottawa, Ont.—p. 412.

Convalescent Serum for Poliomyelitis.—Silverthorne and his associates studied the efficacy of serum therapy in the course of the epidemic of poliomyelitis in Toronto in 1937. The study, begun after the peak of the epidemic, extended over six weeks. The patients were free from paralysis when serum was given. Forty-five alternate patients were and 47 were not given 50 cc. of convalescent pooled serum from paralytic patients infected years before. There was no significant difference between the two groups as to the time the treatment was given and the duration of symptoms. There was a slight but probably not significant difference among the severely paralyzed patients: 2.2 per cent in those given serum compared with 8.5 per cent in the controlled group. In the treated group there were 7 patients with slight, 5 with moderate and 1 with severe paralysis; the respective figures for the control group were 6, 4 and 4. The results of the study would suggest that serum in the doses given did not prevent paralysis.

Cancer Research, Baltimore

1:517-594 (July) 1941

- Inheritance of Retinoblastoma and Its Relationship to Practical Eugenics. C. V. Weller, Ann Arbor, Mich.—p. 517.
Early Cancer of Stomach: Study of 1,299 Resected Ulcers and 2,408 Cancers. W. C. MacCarty Sr., Rochester, Minn.—p. 536.
Malignant Melanoma Cutis. S. Peller, New York.—p. 538.
Antigenic Nature of Purified Chicken Tumor Agent: Preliminary Report. M. K. Barrett, New York.—p. 543.
Growth of Brown-Pearce Carcinoma in Anterior Chamber of Eyes of Tumor-Immune Rabbits. O. Saphir, M. Appel and A. A. Strauss, Chicago.—p. 545.
Cellular Injury in Relation to Proliferative and Neoplastic Response. V. Menkin, Boston.—p. 548.
Resistance of Tumor Cells in Tissue Culture to Growth-Inhibiting Action of Amines. A. M. Brues and Elizabeth B. Jackson, Boston.—p. 557.
Induction of Leukemia in Mice Following Percutaneous Application of 9,10-Dimethyl-1,2-Benzanthracene. L. W. Law, Bar Harbor, Maine.—p. 564.
Genetic Analysis of Induction of Tumors by Methylcholanthrene: II. Influence of Spindle Cell Sarcoma and of Carcinoma of Skin on Each Other. L. C. Strong, New Haven, Conn.—p. 572.
Sex Difference in Conjoint Tumoral Reaction of Guinea Pig Toward Natural and Artificial Estrogens. A. Lipschütz, L. Vargas Jr. and J. Palma, Santiago, Chile, South America.—p. 575.

Endocrinology, Springfield, Ill.

29:1-164 (July) 1941. Partial Index

- Effect of Increasing Number of Daily Injections of Gonadotropic Preparations on Ovaries of Immature Rats. R. K. Meyer and W. H. McShan, Madison, Wis.—p. 31.
Antihormone Production to Crude and Purified Pregnant Mare Serum Preparations. A. S. Gordon, New York.—p. 35.
Vaginal Estrus in Irradiated Mice. S. H. Geist, J. A. Gaines and G. C. Escher, New York.—p. 59.
Absorption of Pellets of Crystalline Testosterone, Testosterone Propionate, Methyl Testosterone, Progesterone, Desoxycorticosterone and Stilbestrol Implanted in the Rat. T. R. Forbes, Baltimore.—p. 70.
Effect of Testosterone Propionate on Reproduction in the Female. J. W. Huffman, Chicago.—p. 77.
Beneficial Action of Testosterone in Experimental Renal Atrophy Caused by Ligation of the Ureter. H. Selye and S. M. Friedman, Montreal, Canada.—p. 80.
Radioactive Iodine as Indicator in Thyroid Physiology: III. Iodine Collection as Criterion of Thyroid Function in Rabbits Injected with Thyrotropic Hormone. S. Hertz and A. Roberts, Cambridge, Mass.—p. 82.
Effect of Testosterone Propionate on Creatinuria of Experimental Hyperthyroidism in Male and Female Monkeys. J. W. Jailer, New York.—p. 89.
Effect of Administering Thyrotropic Hormone With and Without Iodine on Thyroid Tissue Metabolism. J. E. Vanderlaan, W. R. Vanderlaan and M. A. Logan, Boston.—p. 93.
Thyroid-Ovarian Relations: I. Influence of Ovarian Hormones on Thyroid Hyperplasia. L. A. Emge and Gert L. Laquer, San Francisco.—p. 96.
Refractoriness Produced by Sodium Retaining Substances. F. A. Hartman and Lena A. Lewis, Columbus, Ohio.—p. 111.
Sodium Chloride and Dextrose Appetite of Untreated and Treated Adrenalectomized Rats. C. P. Richter, with assistance of G. H. Bunch Jr. and H. E. Woods Jr., Baltimore.—p. 115.
Influence of Fever on Vagoinulin and Sympatheticoadrenal Systems. J. Feldman and E. Gellhorn, Chicago.—p. 141.
Effects of Desoxycorticosterone Acetate in Albino Rat. W. H. Carnes, C. Ragan, J. W. Ferrebee and J. O'Neill, New York.—p. 144.
Interpretation of Thymus Bodies. B. F. Kingsbury, Ithaca, N. Y.—p. 155.

New England Journal of Medicine, Boston

225:247-278 (Aug. 14) 1941

- Potentialities of Preventive Geriatrics. E. J. Stieglitz, Bethesda, Md.—p. 247.
Certain Observations in Low Nitrogen, Normal Oxygen Atmospheres Related to Problems of High Altitude Flying. A. M. Butler, J. L. Wilson, C. A. Smith and S. Farber, Boston.—p. 255.
*Chronic Gastritis: Gastroscopic and Clinical Study. C. W. McClure, F. N. Sweetsir and I. R. Jankelson, Boston.—p. 259.
*Recent Developments in Aviation Medicine. J. F. Fulton, New Haven, Conn.—p. 263.

225:279-316 (Aug. 21) 1941

- Standard Electroencephalographic Technic for Localization of Gross Intracranial Lesions. F. A. Gibbs, D. Munro and W. R. Wegner, Boston.—p. 279.
Temporal Arteritis. L. H. Hoyt, G. A. Perera and A. J. Kauvar, Boston.—p. 283.
Electrocardiographic Findings Associated with Gunshot Wound of Heart: Report of Case. W. A. Fraser and M. Texon, New York.—p. 286.
Treatment of Dehydration in Patients with Hypertrophy of Prostate. Retention of Urine and Impairment of Renal Function. F. A. Simeone, Boston.—p. 299.

Chronic Gastritis.—McClure and his associates determined the frequency of chronic gastritis observed at the gastroscopic examination of 611 consecutive patients. Gastritis was present in 269; 150 had the hypertrophic, 51 the atrophic and 68 the superficial type of the disease. To evaluate the symptoms of chronic gastritis, 75 patients were subjected to comprehensive studies. Changes in weight and constipation were not of great clinical importance. Men had more frequently the hypertrophic and women the atrophic type of gastritis. In general the age incidences and the duration of the symptoms for the two types of gastritis were comparable, indicating that gastritis was a chronic condition. Of 68 patients showing hypertrophic or atrophic gastritis, 20 had a duodenal ulcer, 1 had a gastric ulcer and 6 presented roentgen evidence of disease of the gallbladder or had had a cholecystectomy. The presence of gastric ulcer was verified by gastroscopic observation. The condition of the remaining 41 patients was not complicated; 30 complained of epigastric discomfort or mild pain and 9 of severe epigastric pains. The pains were invariably related to the time of food taking and were invariably relieved by the ingestion of food or alkali. Of the 2 patients with atrophic gastritis without pain or discomfort, 1 complained of nausea and fatigue and 1 of fatigue and regurgitation of small amounts of bloody liquid. A

third of the patients with the atrophic type of gastritis complained of fatigue. It was absent in the hypertrophic group. The correlated data show that except for fatigability and absence of epigastric complaint in 2 patients with atrophic gastritis the symptoms of hypertrophic and atrophic gastritis are similar. Ten of the 75 patients had symptoms characteristic of peptic ulcer. Roentgen observations were of inconsequential value as a direct aid in the diagnosis of gastritis. However, barium gastrointestinal studies were of value in determining the presence or absence of esophageal lesions, cancer, ulcer of the stomach, pyloric obstruction, duodenal ulcer and lesions elsewhere in the small or large intestine.

Aviation Medicine.—Fulton summarizes the recent literature on aviation medicine. The limitations of air combat rest more with the pilot than with the plane, and the government that succeeds in adequately protecting the pilot through study of his physiologic needs will have a decisive strategic advantage in combat. Modern combat flying, especially the dive bombing maneuver, causes the development of centrifugal forces along the longitudinal axis of the body drawing blood away from the head and causing collapse from acute cerebral anoxia. A healthy young adult can withstand a positive acceleration along the vertical axis of the body of 4.5 g (four and a half times the force of gravity) for approximately five seconds. But from the point of view of safety in aviation the pilot's coordination prior to loss of consciousness is vital. The condition of the organism determines the capacity to withstand acceleration; an alcoholic spree and an empty stomach diminish it. The German literature also states that the following favor the pilot's capacity: inhalation of 5 or 6 per cent carbon dioxide, vasoconstrictor drugs, increase in the tone of the capillary wall, posture and mechanical constriction of the abdomen and of the lower extremities by pneumatic belts and trousers. The Germans favor a crouching position, with the legs flexed against the abdomen. All factors that tend to improve the body's resistance to positive acceleration are those that keep blood in the head. Recently the use of oxygen in low altitude ranges has become an established practice to avert impairment in mental functions as it has among high altitude squadrons for the sake of washing out nitrogen. For the breathing of oxygen an ideal face mask is yet to be found. For supplying oxygen the new aluminum alloy tanks weigh much less than the old tanks but they are more vulnerable to machine gun penetration and are probably a greater hazard to the pilot and the ship than the heavy tanks. Pressure cabin planes have not proved feasible for light combat aircraft. The experiencing by high altitude pilots of symptoms similar to those of bends not attributable to anoxia, acceleration or metabolic disturbance has been thought to be due to sudden pulmonary air embolism. Direct proof that high altitude bends are caused by the liberation of nitrogen has not been established, but the similar symptoms make indirect evidence highly impressive. Tests in decompression chambers suggest that at least 50 per cent of young male adults can withstand altitudes up to 40,000 feet for from one to six hours without bends developing. Hence high altitude squadrons should be selected on the basis of these tests. The replacing of nitrogen with helium or by preoxygenation is not feasible, but with the delaying effects of pure oxygen from the ground up bends may cease to be a serious problem in military aviation. Regarding anoxia of the adrenals, it is not yet clear whether the administration of adrenal cortex extract would facilitate the pilot's adjustment to high altitudes or improve his performance.

Northwest Medicine, Seattle

40:265-308 (Aug.) 1941

- Cerebral Birth Injury. M. G. Peterman, Milwaukee.—p. 267.
Glucose-Insulin Treatment in Hyperemesis Gravidarum. D. F. Bice, Yakima, Wash.—p. 270.
Practical and Inexpensive Plasma Bank. L. J. Rosellini, Mildred Porter and C. R. Jensen, Seattle.—p. 272.
Total Gastrectomy for Diffuse Superficial Carcinoma. J. W. Baker, Seattle.—p. 277.
Curare and Scopolamine in Convulsive Therapy. R. J. Bennett, Fort Steilacoom, Wash.—p. 280.
Meningococcal Septicemia: Prolonged Case Treated with Three Sulfonamide Drugs. Marian G. Hayes, Eugene, Ore.—p. 284.
Bone Tumor: Problem of Diagnosis. C. G. Bain, Chehalis, Wash.—p. 287.

Ohio State Medical Journal, Columbus

37:725-820 (Aug.) 1941

- Diet, Health and Defense. C. A. Elvehjem, Madison, Wis.—p. 741.
Method for Instilling Iodized Oil in Trachea for X-Rays. J. R. Jarvis, Van Wert.—p. 746.
Previous Uterine Infection as Predisposing Cause for Spontaneous Rupture of Uterus. J. G. Fleming, Cincinnati.—p. 747.
Thrombosis and Embolism of Abdominal Aorta: Report of Case with Obstruction of Renal Arteries. M. L. Siegel and C. F. Garvin, Cleveland.—p. 750.
Chills and Fever as Manifestation of Sulfathiazole Toxicity. W. E. Molle and W. Buck, Cincinnati.—p. 752.
Acute Suppurative Nephritis Following Hysterectomy: Case Report. E. Eichner, Cleveland.—p. 754.
Clinical Aspects of Malignancy of Lung: Case Reports. O. Berghausen, Cincinnati.—p. 757.
Cranio-cerebral Injuries. J. N. Wychgel and W. J. Urbanski, Cleveland.—p. 761.
Thoracentesis of Chest—Inexpensive Method. A. A. Roth, Cleveland.—p. 764.
Surgical Relief of Intractable Pain in Upper Extremity Due to Malignant Disease. L. M. Weinberger, Chicago.—p. 765.
Specific Therapy in Costeasonal Management of Hay Fever: Importance of Controlled Variation of Dosage. L. E. Seyler, Dayton.—p. 768.
Unilateral Exophthalmos and Spinal Cord Compression in Case of Multiple Myeloma. J. Flynn and S. Sailer, Cincinnati.—p. 771.

Public Health Reports, Washington, D. C.

56:1581-1636 (Aug. 8) 1941

- Skin Hazards in Airplane Manufacture. L. Schwartz and J. P. Russell.—p. 1581.
*Protection Test in Mice for Identification of Leptospirosis Icterohemorrhagica (Weil's Disease). C. L. Larson.—p. 1593.
Study of Relative Toxicity of Molecular Components of Lead Arsenate. L. T. Fairhall and J. W. Miller.—p. 1610.

56:1637-1672 (Aug. 15) 1941

- Observations on Use of "Phenol" Larvicides for Mosquito Control. F. L. Knowles, W. V. Parker and H. A. Johnson.—p. 1637.
Deposition and Removal of Lead in Soft Tissues (Liver, Kidneys and Spleen). L. T. Fairhall and J. W. Miller.—p. 1641.
Weil's Disease: Report of Fifty-One Cases Occurring in Puerto Rico and United States. C. L. Larson.—p. 1650.
Some Special Epidemiologic and Clinical Features of Plague in Northeastern Brazil. A. Macchiavello.—p. 1657.

Protection Test for Identification of Weil's Disease.

—Larson describes a specific and easily interpreted mouse protection test for the diagnosis of Weil's disease. He determined the efficacy of the test by testing serums from 25 human beings, 13 wild rats and 1 dog suffering from leptospirosis for the presence of specific protective antibodies against *Leptospira icterohemorrhagiae*. Material from 3 rabbits hyperimmunized against *L. icterohemorrhagiae* was also tested. Protective antibodies were detected in all of the serums. No protective antibodies against *Leptospira* were produced following influenza, malaria, poliomyelitis, Rocky Mountain spotted fever, typhus, Q fever, tularemia, rat-bite fever, relapsing fever, infectious jaundice, syphilis and yellow fever. Indefinite results were obtained with serums derived from rabbits hyperimmunized against *Leptospira canicola*. The author found that protective antibodies against Weil's disease develop during the second week of the disease and persist for at least five years. The protective antibody titer roughly follows the agglutinin titer. The test is carried out in the following manner: The kidneys and liver of a mouse dead or dying of leptospirosis are removed, weighed and finely ground in a mortar; sufficient physiologic solution of sodium chloride is added to make a 10 per cent suspension. Further tenfold dilutions are made of this suspension so that final dilutions from 1:100 to 1:100,000 are obtained. The serums to be tested are diluted to 1:100 with saline solution and passed through a Berkefeld N filter to insure sterility. Equal quantities of the diluted serum and tissue suspensions diluted to 1:1,000 are mixed and allowed to stand at room temperature for one to two hours. Ten mice are inoculated intraperitoneally with 0.3 cc. of each dilution of tissue suspension and a similar number with 0.6 cc. of each serum-tissue mixture to be tested. The mice are observed for two weeks after inoculation. Those dying before the fourth day following injection are not considered, as they die of secondary infection, trauma or other conditions not due directly to the agent. All mice surviving this period are observed daily for the development of jaundice. Protection is stated in terms of mice surviving fourteen days compared to those still alive four days after inoculation.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London 22:111-178 (June) 1941

- Effect of Certain Antiseptics on Respiration of Brain Tissues in Vitro. M. C. Manifold.—p. 111.
Antilymphocytic Serum. A. H. Cruickshank.—p. 126.
Nature of Antibacterial Agents Present in *Pseudomonas Pyocyanea* Cultures. R. Schoental.—p. 137.
Bacterial Inhibition by Aminosulfonic Analogues of Some Natural Amino-carboxylic Acids. H. McIlwain.—p. 148.
Transplantable Mammary Fibrosarcoma of Rat Showing Sarcomatous Changes. F. R. Selbie.—p. 156.
*Active Immunization Against Epidemic Typhus by Means of Vaccines Prepared from Endemic Virus. M. Ruiz Castaneda.—p. 167.
Oxygen Labile Hemolysin or Toxin of *Clostridium Welchii*. E. W. Todd.—p. 172.

Active Immunization Against Epidemic Typhus.—Ruiz Castaneda used typhus vaccines prepared from endemic virus for immunization against epidemic typhus. The virus used for preparing the vaccines was the L strain obtained from a typhus patient in Mexico City in 1936. It has the properties of murine virus and therefore grows readily in the guinea pig tunica vaginalis and in the peritoneum of irradiated rats. The lungs of mice inoculated with peritoneal rat washings shown to be rich in rickettsias and free of bacteria by staining are pooled and emulsified; from 5 to 7 cc. of citrate solution is used for each pair of lungs. The tissue emulsion is lightly centrifuged at low speed to remove gross particles and the supernatant material is checked microscopically for richness and purity. Lung emulsions contain an abundance of rickettsias and are suitable for passage by intranasal instillation in rats, but because of the frequency of bacterial contaminants and pneumonia in rats the author built up the potency of the inoculum by the guinea pig rat-mouse passage sequence. Previous reports indicated that small amounts of the lung vaccine protected guinea pigs against infection by the L strain of murine typhus virus. Using a vaccine having a turbidity of 2 on the McFarland scale, Finlayson and Grobler reported successful protection of guinea pigs against infection by both endemic and epidemic virus from South Africa; 1 cc. protected against the endemic strains and two such doses against epidemic strains. If the vaccine was concentrated to one-half its original volume by precipitation with alum, animals were protected against the epidemic strain by a single 1 cc. dose. Because of the practical importance of the problem the author attempted to determine the minimal quantity of murine lung vaccine necessary to protect against classic European typhus. The Breinl strain was used as a test virus. The dose required to produce certain infection in all unvaccinated controls represented 0.2 Gm. of infected guinea pig brain prepared as a lightly centrifuged emulsion. The vaccine was standardized by the nephelometric method and was administered in 1 cc. doses at weekly intervals. Fourteen animals considered protected that received an average dose of 2.78 cc. of lung vaccine equivalent to a turbidity of 2 on the McFarland scale had an average of thirty-five hundredths day of fever. However, 10 partially protected animals received an average dose of 1.25 cc. and had an average of two and nine-tenths days of fever, while 3 unprotected guinea pigs had an average dose of 1.15 cc. and seven days of fever. Even a single 1 cc. dose of a vaccine of high antigenic content given to 8 guinea pigs conferred a considerable degree of protection. However, doses of vaccines of lower rickettsia content should be multiple.

British Journal of Ophthalmology, London 25:349-396 (Aug.) 1941

- Mechanism of Intraocular Pressure in Mammalia. T. Henderson.—p. 349.
Distance Object Test Type for Children. F. E. Preston.—p. 357.
Argyrosis of Conjunctiva, Cornea and Tear Sac. A. Loewenstein.—p. 360.
Retinopathia Centralis Angiospastica (Angioneurotica) and Serosa Allergica, and Their Relation to Detachment of Retina. A. Loewenstein.—p. 369.
Blue Sclerotics: Case. J. P. S. Walker.—p. 383.

British Medical Journal, London

2:187-216 (Aug. 9) 1941

- The Mental Defective in the Army. F. J. S. Esher.—p. 187.
Hypoprothrombinemia and Avitaminosis K in Man. R. Kark and A. W. Souter.—p. 190.
Rupture of Drumhead as Wartime Injury. A. B. Alexander.—p. 195.
Recovery from Uremia Following Crush Injury. R. G. Henderson.—p. 197.
Allergic Shock Following Schultz-Charlton Test. R. M. Calder.—p. 198.

Glasgow Medical Journal

18:33-54 (Aug.) 1941

- Unusual Case of Staphylococci Pyemia. J. W. Hamilton and L. W. Price.—p. 33.

Journal of Physiology, Cambridge

100:1-124 (Aug.) 1941

- Potassium Accumulation in Muscle and Associated Changes. P. J. Boyle and E. J. Conway.—p. 1.
Pharmacologic Actions of Morphothebaine-Dimethylether. J. A. Gun.—p. 64.
Influence of Secretin on Pancreatic Secretion in Cat. E. J. W. Barrington.—p. 80.
Hemopoietic Activity of Mammalian Livers. F. X. Aylward, W. S. M. Grieve, B. R. S. Mainwaring and J. F. Wilkinson.—p. 94.
Influence of Anterior Pituitary Extracts on Insulin Content of Pancreas of Hypophysectomized Rat. M. Griffiths.—p. 104.
Antagonism Between Insulin and Posterior Lobe Pituitary Extract. M. Griffiths.—p. 112.
Permeability Change of Stimulated Nerve. J. F. Danielli.—p. 117.

Lancet, London

2:149-176 (Aug. 9) 1941

- *Study of Pathogenesis of Thyrotoxicosis. F. F. Rundle.—p. 149.
Psychiatric Reactions of Civilians in War Time. A. Harris.—p. 152.
Calcium and Phosphorus Studies in Parathyroid Tetany. J. D. Robertson.—p. 156.
Recovery from Crush Syndrome: Case. C. J. Longland and J. Murray.—p. 158.
Isolation of Hemolytic Streptococci from Wounds. A. E. Francis.—p. 159.
Cerebral Hemorrhage in Infant Born by Cesarean Section. C. P. Lepage.—p. 160.

Pathogenesis of Thyrotoxicosis.—Rundle states that, although the ocular component and thyroid intoxication are usually associated, they may occur as independent phenomena. Thus in 332 consecutive instances of thyrotoxicosis there was retraction of the lids or proptosis or both in about 3 of every 4 patients. But ocular signs without goiter or hypermetabolism are not rare. The clinical evidence that the ocular changes have an extrathyroid origin supports the pituitary theory of exophthalmic goiter. Experimental data provide the most suggestive evidence. Extracts of anterior lobe not only activate the thyroid and cause secondarily all the manifestations of thyrotoxicity but also result in exophthalmos. Some of the clinical factors associated with the onset of thyrotoxicosis appear to act by disturbing the higher controlling mechanism of the gland. There is evidence also that the responsiveness of the thyroid epithelium is variable. Certain thyroid conditions, notably simple goiter, may predispose to the thyroid intoxication of exophthalmic goiter. Therefore it is convenient to speak of pituitary and thyroid factors in the pathogenesis of thyrotoxicosis. There was a family history of thyroid disease in 22 per cent of the 322 patients with thyrotoxicosis. Antecedent simple goiter had been present in 18 per cent, it was associated with psychic trauma with the onset of symptoms in 42 per cent and the disease developed within two years of the menopause in 20 per cent. When a psychopathic personality or a psychic trauma is associated with the onset, psychoneurosis may coexist with thyrotoxicosis, but it is not an integral part of the syndrome. Follow-up studies show a comparatively heavy incidence of nervous disorder after thyroidectomy. This seems to favor the concept of thyrotoxicosis as a general neuroendocrine disorder in which thyroidectomy removes only the most important of the glandular components, leaving untouched the fundamental disorder. It has been claimed (Crile 1935) that persistent hyperexcitability suggests that a constitutional sympatheticotonia forms the background on which thyroid hyperplasia develops. Although it is possible that a labile autonomic nervous system predisposes to thyrotoxicosis, it is doubtful whether a division of that system is especially affected.

Schweizerische medizinische Wochenschrift, Basel

71:701-732 (June 7) 1941

Estimation and Treatment of Neurotics in Active Military Service. R. Brun.—p. 701.

Psychohygiene in Front Line. M. Boss.—p. 707.

Therapeutic Problems in Work of Psychiatric Consultation Office in Military Medical Institute. K. Binswanger.—p. 711.

*Vitamin C and Military Sport. H. Brunner.—p. 715.

Directing Lines for Localization and Removal of Foreign Bodies in War Injuries. A. Zuppinger.—p. 716.

Wire Screen Chin Cap: Suggestion for First Aid for Jaw Injuries in the Field. W. Roos.—p. 719.

Bilateral Avulsion of Spina Iliaca Anterior Inferior. W. Bachmann.—p. 721.

Psychology of Obstinacy in Military Service. T. Bovet.—p. 722.

Vitamin C and Military Sport.—Brunner calls attention to the fact that the marching contest of the Swiss army, with full pack, over a distance of 41 kilometers, with a grade of 500 meters, makes great demands on the physical endurance of men. He studied the physical condition of 10 men who were subjected to an intensive preparatory training. To obtain optimal physical performance capacity, 300 mg. of a vitamin C preparation was given daily until the vitamin was excreted in the urine. When this took place the daily dose was reduced to 200 mg. The saturation experiment disclosed vitamin C deficiencies of from 600 to 1,800 mg., on the average of 1,210 mg. It is noteworthy that two men who were abstinent had the lowest vitamin deficiency. During the period of training the daily vitamin C requirement was 200 mg. Muscular pains brought on by the intense training subsided under the influence of vitamin C medication. Eight of the 10 men were able to take part in the marching contest. Their performance was satisfactory. All completed the contest. Whereas many of those who did not receive vitamin C developed muscular spasms in the course of the march, only one of the author's men manifested this symptom, and for only a brief period. After a short rest period (two hours) the physical and mental fatigue was slight. All the men who were given vitamin C expressed satisfaction with the effect. They felt fresher, stronger and better able to stand the exertion. Especially gratifying was the efficacy of the vitamin against muscular pains.

Bollettino, Milan

11:205-234 (Oct.-Nov.-Dec.) 1939. Partial Index

Treatment of Whooping Cough in Blood Serum of Convalescents from Parotitis. S. Saggese.—p. 212.

Parotitic Blood Serum in Whooping Cough.—Saggese observed an epidemiologic antagonism between parotitis and whooping cough. The latter was permanently arrested in several patients when parotitis had developed. He had also observed that children suffering from parotitis either do not develop whooping cough or have it in attenuated form. Saggese injected blood serum obtained from convalescents in the second or third week of parotitis in 23 patients with whooping cough. Improvement was evident after the first or second intramuscular injection of 8 cc. of serum, and a cure was obtained after the third.

Arch. Clín. e Inst. endocrinol., Montevideo

1:605-932 (No. 2) 1937-1940. Partial Index

*Action of Vitamin B₁ in Funicular Myelosis of Pernicious Anemia. J. C. Mussio Fournier and F. Rawak.—p. 637.

Vitamin B₁ in Funicular Myelosis.—Mussio Fournier and Rawak report the case of an apparently normal woman, aged 54, who complained of glossitis. Three years later the patient exhibited pernicious anemia and symptoms of acute funicular myelosis of the pseudotabes type. Paralysis began in the legs and rapidly involved the trunk and the arms. Raw liver by mouth and injections of liver extract and of vitamin B₁ were administered. Vitamin B₁ was given in daily doses of 10 mg. for the first twenty-four days and of 2 mg. for the following days up to a total of 300 mg. in three months. The neurologic symptoms improved early in the course of the treatment, even before the change in the blood picture. The more recent symptoms showed earlier and more complete improvement. By the end of the treatment the muscles of the trunk, arms and hands were normal; those of the legs were almost normal. The patient

was able to walk alone. The glossitis has disappeared. The author believes that vitamin B₁ is a specific in the therapy of the neurologic symptoms of pernicious anemia and that the earlier the treatment the better the results.

Medizinische Klinik, Berlin

37:501-524 (May 16) 1941. Partial Index

Clinical Observations on Serious Familial Botulism Infection. G. Breitzke.—p. 507.

*Practical Experiences with Simultaneous Vaccination and Active Immunization with Diphtheria Toxoid in an Epidemic of Diphtheria. Zippel.—p. 510.

Cause and Estimation of Heterotopic Stimulus Formation on Heart. F. Brauch.—p. 511.

Active Immunization in Diphtheria.—Zippel reports that when an epidemic of diphtheria developed in a large orphan home active immunization was at once instituted. Approximately 500 children were given a single administration of toxoid. At the same time they were given 2,000 units of diphtheria serum. This procedure greatly reduced the number of new cases, and those which developed were atypical. To prevent further development of cases, the children were given a second dose of toxoid six months after the first. Two vaccinations protected a large percentage of children against diphtheria. If vaccinated children develop an angina with diphtheria-like odor (particularly during the first few months after vaccination) the possibility of an atypical diphtheria should be considered and serum treatment instituted. From his experiences with smears, the author concludes that they are of little value in the diagnosis of diphtheria. Children should be vaccinated against diphtheria before they enter school. The vaccinations should be done during the season that is free from epidemics of diphtheria. Active immunization against diphtheria is especially important in institutes and homes for children; not only should all inmates be vaccinated against diphtheria, but the newly admitted should be currently immunized.

Maandschrift voor Kindergeneeskunde, Leyden

10:219-266 (March) 1941. Partial Index

*Nasal Allergy in Children. H. A. E. van Dishoeck.—p. 232.

*Acute Pancreatitis in Connection with Mumps: Case. J. M. C. Visscher-Jolles.—p. 259.

Nasal Allergy in Children.—Among 500 children varying in age between 3 and 15 years with otorhinolaryngologic disorders, van Dishoeck discovered 65 in whom allergy was suspected. Fifty (10 per cent) of the total number showed positive cutaneous reactions, chiefly for inhalants but in some cases also for food allergens. Sensitization to more than one allergen was present in 41 cases; only 3 uncomplicated cases of hay fever were found. In 35 cases asthmatic complaints were present. Cutaneous reactions were positive most frequently with house dust, pollen and feathers. Eggs and milk produced positive reaction in 3 and 2 cases, respectively. The number of eosinophils and lymphocytes in the blood were nearly always considerably increased. Eosinophils in the nasal mucus, allergic edema of the antrums, allergic degeneration of the turbinates, eczema during infancy and a family history of allergy were demonstrable in about half of the cases. Many patients were cured by elimination of the offensive allergens. Patients with hypersensitivity to house dust were successfully desensitized. The author thinks that the detection and treatment of nasal allergy in children will be of great importance for the prevention of asthma in adults.

Concurrence of Acute Pancreatitis with Mumps.—Visscher-Jolles reports the clinical history of a boy aged 8 months. When the author first saw him, two days after the first signs of indisposition, the child was in a deep coma. Examination disclosed hyperglycemia and severe leukocytosis, and the diastase ferment content of the urine was extremely low. The disorder was diagnosed as acute pancreatitis. The child recovered. Although acute pancreatitis is usually rapidly fatal, the form that complicates infectious diseases is rarely fatal. It is possible that in the case under consideration the pancreatitis was brought on by mumps. An epidemic of mumps existed at the time in the school attended by the siblings of the boy, and a brother had been at home with mumps the week preceding the development of the disease.

Book Notices

Fit to Fly: A Medical Handbook for Fliers. By Malcolm C. Grow, M.D., Lt. Col., Medical Corps, United States Army, and Harry G. Armstrong, B.S., M.D., Captain, Medical Corps, United States Army. Cloth. Price, \$2.50. Pp. 387, with 29 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1941.

Colonel Grow and Captain Armstrong have produced a well written, easily understandable and timely volume to acquaint and equip both nonfliers and fliers with information concerning the reactions of the human body to the rapidly changing environmental effects encountered while in the air. The book begins with the subject of medicine in aviation; it then passes on to the protective health measures of the aviator (hygiene) and proceeds to the physical examination of the flier. Thereafter the writers discuss the body reactions to altitude, oxygen deprivation, atmospheric pressure changes, acceleration and deceleration, sensory illusions, and fatigue in flight. A chapter is devoted to aviation accidents and first aid. Protective devices to prevent untoward effects of flying are discussed. Because of the wide ranges of fliers into distant lands and different climates, the final chapter of the book is devoted to tropical diseases and ailments most likely to be encountered. The book should be of pronounced value to those who take to the air and should be of direct benefit to aviators so that they can "keep them flying."

The Development of the Sciences: A Series of Lectures Delivered at Yale University Under the Auspices of the Yale Chapter of Gamma Alpha. Second Series. By Oystein Ore, Frank Schlesinger, Henry Margenau, John Arrend Timm, Chester Ray Longwell, Lorraine Loss Woodruff, Walter Richard Miles and John Farquhar Fulton. Edited by L. L. Woodruff. Cloth. Price, \$3. Pp. 336, with one illustration. New Haven: Yale University Press; London: Oxford University Press, 1941.

Occasionally there appears a collection of lectures that offers interesting and thought provoking reading for every one regardless of his field of specialization: The Development of the Sciences is one of these collections. The material in this book represents the fields of mathematics, astronomy, chemistry, physics, geology, biology, psychology and medicine and was first offered during the winter and spring of 1940 as a series of lectures sponsored by the Yale University chapter of Gamma Alpha. As these lectures were designed for the general public, the authors have made no attempt to become technical; yet the sciences are traced from their beginnings to the more modern trends with no loss of interest. The articles are so forcefully written and the material so absorbing that the reader will loathe interruptions.

Every chapter is so well written that all must be commended. However, the discussions on astronomy, biology, psychology and medicine will be of particular interest to the physician. Astronomy has always intrigued man, partly because of the mysticism associated with this science. The description of the earlier studies by the Greeks cogently visualizes the slow and tedious deductions often necessary as the prelude to subsequent exciting findings. The names of Galileo and Bacon are familiar to every one, but this chapter acquaints the reader with the less well known but equally important contributors of earlier and later eras. The close relationship between mathematics, physics and astronomy and the part it has played in the development of our other sciences offers a fitting background for the promotion of a more avid interest in subjects which may be neglected in our time pressed days. Who can fail to appreciate the romantic possibilities of Franklin's famous kite experiment and Galvani's accidental discovery of the convulsive movements of the frog's leg while preparing a broth from these legs for his wife, who was suffering from a chest ailment?

Huxley has said that medicine is the foster mother of chemistry, botany and comparative anatomy and physiology. The farewell chapter was to have been written by Dr. Harvey Cushing, but after his untimely death Dr. John F. Fulton agreed to undertake the assignment. He has attained the same degree of sustained literary entertainment that the other chapters hold. This volume will be well received by those who are in the habit of keeping a book by their bedside or favorite easy chair.

Der Rücken des Menschen, die Erkennung und Behandlung seiner Erkrankungen: Eine Anleitung für Studierende der Medizin und praktische Aerzte. Von Prof. Dr. med. O. Veraguth, und Dr. med. C. Braendli-Wyss. Cloth. Price, 20 Swiss francs; 12 marks. Pp. 232, with 96 illustrations. Bern: Hans Huber, 1940.

The author illustrates by diagrams of trunk and body posture and an elaborate system of lines and landmarks the technic of determining asymmetry. He describes in detail inspection of the back, palpation of the back and passive movements of the neck and head. He has copied Mennell's interesting and instructive series of diagrams of back examination and manipulation. His description of cutaneous sensation is excellent. He describes the interesting sinuvertebral nerve, which did not figure prominently in the English literature until emphasized by Steindler. He makes an interesting division of the lumbalgias into those due to traumatic muscular involvement, rheumatic muscular involvement, tendoperiosteal, neuritic, muscular, ligamentous, articular, ex-articular and osseous. It appears to be a highly technical description for medical students and general practitioners.

Introduction to Physical Biochemistry. By J. M. Johlin, Ph.D., D.Sc., Associate Professor of Biochemistry in the Vanderbilt University School of Medicine, Nashville. Cloth. Price, \$2.75. Pp. 231, with 10 illustrations. New York & London: Paul B. Hoeber, Inc., 1941.

The contents of the twelve chapters that make up this volume would have been better covered if "of the Blood" had been added to its title, for all but one of them are limited to a consideration of "the external environment of tissue cells." In toto, the book covers the application of standard physicochemical methods of analysis to the blood with the sixth chapter, however, thrown in on "characteristics of colloidal state of matter." Some historical asides here try to do justice to Thomas Graham's great discoveries and make fine reading; for the rest, however, the author believes that Graham's modern followers have added nothing that the physical chemists did not first bring in. The net result is that the blood remains an aqueous pabulum, still essentially a dilute solution, in spite of the author's warning that "a fluid such as blood cannot be considered as a simple solution"—in which ions, acids and alkalis, oxygen and carbon dioxide, colloids and crystalloids try ceaselessly to get into equilibrium. The hydronium concept replaces that of the hydrogen ion; and, to explain buffering, the proteins receive their deserved larger consideration over the once solely dominant polybasic salts. The volume (well made and available at a decent price) therefore recommends itself to all in search of the factually established and the theoretically believed. The author's scheme of presentation is excellent.

Biology of the Laboratory Mouse. By The Staff of The Roscoe B. Jackson Memorial Laboratory. Clarence C. Little, Director. George B. Snell, Editor. With a chapter on Infectious Diseases of Mice. By J. H. Dingle, Harvard Medical School, Boston. Cloth. Price, \$7. Pp. 497, with 172 illustrations. Philadelphia: Blakiston Company, 1941.

This book represents an attempt to assemble widely scattered information relating to the mouse on reproduction and embryology, genetics, histology, neoplasms, endocrinology, parasitology and bacteriology. Accordingly the thirteen chapters discuss the early embryology of the mouse, reproduction, histology, spontaneous neoplasms in the mouse, gene and chromosome mutations, the genetics of spontaneous tumor formation, the genetics of tumor transplantation, endocrine secretion, the milk influence in tumor formation, inbred and hybrid animals and their value in research, parasites, infectious diseases in mice, care and recording. Several authors have combined their efforts to produce the book, each being responsible for one or more chapters. These authors, who are from the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine, with the exception of J. H. Dingle from Harvard Medical School, are C. C. Little, G. D. Snell, J. J. Bittner, A. M. Cloudman, E. Fekete, W. E. Heston, W. L. Russell and G. W. Woolley. The book is conducive to easy reading, the index adequate, the illustrations numerous and excellent. At the end of each chapter is a fairly extensive bibliography, a desirable feature for this type of book. The volume should be a useful addition to the laboratory library. It will serve as a ready reference for a better understanding of the biology of this useful experimental animal.

General Chemistry. By Harry N. Holmes, Professor of Chemistry in Oberlin College, Oberlin, Ohio. Fourth edition. Cloth. Price, \$3.75. Pp. 720, with 199 illustrations. New York: Macmillan Company, 1941.

The present volume reflects the remarkable advances that have been made not only in chemistry but in the technic of teaching as well. Chemical textbooks of fifteen or twenty years ago seemed superb at that time and created an impression of finality—as if there were little more which could be added to the fundamentals of that science. But in this excellent volume we find discussions of many new topics, among them the structure of the atom, electrovalence, covalence, coordinate valence, the relative sizes of ions in crystals, radiation chemistry, uranium fusion, cyclotrons, vitamins, chemotherapy and strategic raw materials. Even the definitions of fundamental laws and principles have changed, and it is now noted that some of these which were once absolute and solid as the rock of Gibraltar have lost, like that rock, some of their unqualified self assurance. The subject matter is presented in a manner that holds the interest of the reader. Professor Holmes's literary style is something to be particularly noted. It has the simplicity, directness and change of pace that marks good writing. The presentation of a concept is almost invariably accompanied by a practical application or illustration that drives home the point. The text is generously supplemented with diagrams, sketches, tables and photographs. The reader is made to feel that the study of chemistry is the study of the basis of our very life and existence and not merely a discipline to hurdle on the way through college. It is altogether evident that an interesting presentation of the subject such as this can hardly fail to attract students to chemistry as a life work. This is, in the long run, perhaps the most important contribution a general textbook can make. The publishers are to be commended for the attractive manner in which the volume is designed and printed.

Archiv und Atlas der normalen und pathologischen Anatomie in typischen Röntgenbildern. Die Wirbelsäulenverletzungen und ihre Ausheilung: Experimentelle, pathologisch-anatomische und röntgenologisch-klinische Untersuchungen. Von Dozent Dr. med. habil. Alfons Lob, Marine-Stabsarzt d. R. Mit einem Geleitwort von Professor Dr. G. Magnus. Fortschritte auf dem Gebiete der Röntgenstrahlen, Ergänzungsband LXI. Herausgeber: Prof. Grashey. Cloth. Price, 28.50 marks. Pp. 182, with 289 illustrations. Leipzig: Georg Thieme, 1941.

This is a comprehensive publication on the varied spinal deformities resulting from trauma. It is profusely but pertinently illustrated with both roentgen ray findings and actual pathologic specimens, illustrating both the end results in loss of bone, hypertrophies of isolated parts from fibrous and bony growth and the resultant deformities with or without compression of the spinal cord. The healing of bone with the component elements of bone, cartilage and fibrous tissue has been well presented. The roentgenographic views varying with the individual lesions of pedicles, laminae and the bodies of the vertebrae display the best standards of roentgen ray technic. Lob very properly predicates operative interventions such as spinal grafts or laminectomies. One is surprised to find only casual mention of the traumatic protrusions of vertebral disks, which now form such a fertile field for surgeons in this country.

The Principles and Practice of Ophthalmic Surgery. By Edmund B. Spaeth, M.D., Professor of Ophthalmology in the Graduate School of Medicine of the University of Pennsylvania, Philadelphia. Second edition. Cloth. Price, \$10. Pp. 886, with 1,155 illustrations. Philadelphia: Lea & Febiger, 1941.

The first edition of this valuable and popular textbook of ophthalmic surgery was reviewed in these pages on Aug. 29, 1939, a few months after the book appeared. Now comes the second edition, enlarged by some fifty pages and some hundred and twenty new illustrations. A small amount of the text has been rewritten and additions have been made to some of the chapters, notably the chapter on surgery of the extraocular muscles. In the first edition many of the illustrations, particularly the close-up photographs of the eyes, left much to be desired; these have been in part replaced. The line drawings are universally good and the color plates excellent. The printing and bookmaking are of the same high standard as in the first edition. This is one of the best of modern textbooks on ophthalmic surgery. It contains much of value for the experienced surgeon and is virtually indispensable for the beginner.

A Manual of Allergy for General Practitioners. By Milton B. Cohen, M.D., Director of The Asthma, Hay Fever and Allergy Foundation, Cleveland. Cloth. Price, \$2. Pp. 156. New York & London: Paul B. Hoeber, Inc., 1941.

This little volume is essentially a brief thesis on the principles of allergy. The fourteen chapters cover most of the titles discussed in more extensive works on the subject, but in a much more sketchy manner. The author, a well known pioneer in the field and an indefatigable worker for advancements in allergy, does not propose this little book as a textbook which would give the practitioner workable information. He admits that the context is extremely elementary. The volume constitutes a clear, concise and simple statement of the fundamental knowledge necessary for the understanding of the nature of allergy, but for a working knowledge of the subject one would have to proceed to obtain information from additional sources. The status of this book can best be summarized in the words of the author when he says "When one has mastered the material in this manual, he should be ready to read the more advanced and complete discussions contained in the lists of textbooks and monographs which will be found in the bibliography."

Elimination Diets and the Patient's Allergies: A Handbook of Allergy. By Albert H. Rowe, M.D., Consultant in Allergic Diseases, Alameda County Hospital, Oakland, California. Cloth. Price, \$3. Pp. 264. Philadelphia: Lea & Febiger, 1941.

In the first fifty-three pages the author covers most of the field of allergy, leaving the rest of the book to cover an excellent, but brief, discussion of various common and uncommon foods and elimination diets. The technic of management by elimination diets is discussed with the thoroughness that would be appreciated primarily by the specialist. Sample diets and recipes are given in detail. The final fifty pages are entitled "Appendix" and consist of unorganized notes on many subjects, such as vitamins, weight maintenance, environmental control, history forms and directions for pollen therapy. Briefly, the value of the book is in its discussion of foods and the author's methods of diagnosis and treatment by elimination diets. Its weakness is in the attempt to cover the entire field of allergy in addition, without trying to correlate allergy with immunology or with the general field of internal medicine.

Experimental Studies on the Effect of Sulfapyridine on Pneumococci and Gonococci. By Kai Schmith. Translated from Danish by Hans Andersen, M.D. Denne Afhandling er af det lægevidenskabelige Fakultet antaget til offentlig at forsvares for den medicinske Doktorgrad, København, 1941. Paper. Pp. 216. Copenhagen: NYT Nordisk Forlag, Arnold Busck, 1941.

This book, which is written in English with a summary in Danish, consists of an introduction, a historical survey of sulfapyridine and five chapters dealing with the action of sulfapyridine on pneumococci in vitro, the effect of sulfapyridine on experimental pneumococcal infections, studies on the resistance of pneumococci to sulfapyridine, combined sulfapyridine treatment and active or passive immunization, and the effect of sulfapyridine on gonococci. Each chapter consists of two parts, the first being a brief review of previous investigations, the second the author's investigations. In view of the general knowledge of the sulfonamides, this book would probably be of interest only to experimental workers.

The American Illustrated Medical Dictionary: A Complete Dictionary of the Terms Used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Nursing, Veterinary Science, Biology, Medical Biography, etc., with the Pronunciation, Derivation, and Definition. By W. A. Newman Dorland, A.M., M.D., F.A.C.S., Lieut.-Colonel, M.R.C., U. S. Army. With the collaboration of E. C. L. Miller, M.D. Nineteenth edition. Fabrikoid. Price, \$7; Thumb-Indexed \$7.50. Pp. 1,647, with 914 illustrations. Philadelphia & London: W. B. Saunders Company, 1941.

Again comes a revision of this standard medical dictionary. More than two thousand new words have been added, hundreds defined for the first time in the present edition of this book. In this revision the editorial department of the American Medical Association has cooperated. The American Illustrated Medical Dictionary is the standard adopted by the press of the American Medical Association.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

INABILITY TO GAIN WEIGHT IN APPARENTLY NORMAL MAN

To the Editor:—A patient complains of inability to gain weight. He has never been sick except for measles, though he is now 32. He is definitely nervous but otherwise has no complaints. He eats a well rounded diet, averages 2,000 to 2,500 calories a day, and does not eat between meals. He never has headaches, has no gastrointestinal, genitourinary or cardiac-renal complaints, sleeps fairly well and smokes ten cigarettes a day. He exercises moderately and works in a printer's shop. Though married six years, his wife has never been pregnant. He is thin, alert, cooperative and slightly nervous. He drums with his fingers and taps with his feet unconsciously. The pupils appear slightly dilated; the eyes otherwise are normal. The thyroid is not palpable; the pulse rate is 90 at rest; the palms are sweaty. There is a slight tremor when the hands are outstretched with the fingers spread. The blood pressure is 120 systolic and 80 diastolic. Examinations are otherwise negative (including the genitals). The basal metabolic rate, repeated several times at weekly intervals, has been -28 , -32 , -28 , -30 . The machine and technic have been carefully checked and other tests have been as expected. Would hyperinsulinism explain this picture, especially the low basal metabolic rate? What other diagnosis should be considered?
M.D., Massachusetts.

ANSWER:—There is nothing in the history as here recorded to suggest hyperinsulinism. Patients who have hyperinsulinism have a clearcut clinical syndrome associated with hypoglycemia. Symptoms appear between meals or after violent exercise and are promptly relieved by the administration of sugar or food. The diagnosis is usually not difficult and can be established by determining the level of the sugar in the blood after the patient has fasted for twenty-four hours.

As nearly as can be determined by reading this history, it seems that the patient is unduly concerned about his weight; but no record is given of his height or weight. It seems unnecessary for any patient who has never been ill to be concerned about himself. There is often no correlation between a person's weight and his health, and, as a group, underweight persons enjoy better health than those who are overweight. In all probability his size has been predetermined by his heredity and is almost certainly of no importance. Insufficient evidence is given to indicate whether the low basal metabolic rates are of any importance. Hundreds of thousands of persons who have low basal metabolic rates without myxedema are perfectly normal and feel no better when their basal metabolic rates are raised to normal. If an effort is made to raise his basal metabolic rate to between -10 per cent and 0, the patient should understand that it may make no difference whatever in the way he feels.

In conclusion, what this patient seems to need most is reassurance.

Sterility is mentioned, but no record is given as to his sperm count. If this is normal, it is probably his wife who is sterile.

TOXICITY OF VITAMINS

To the Editor:—This office is desirous of obtaining any available information concerning possible harmful effects occasioned by overdoses of vitamins. Your courtesy in this matter is appreciated.

Cecil G. Dunn, Captain, Q. M. C., assistant to the Quartermaster General, Washington, D. C.

ANSWER:—None of the vitamins important in human nutrition is considered toxic under ordinary circumstances. Large doses of carotene may lead to carotenemia, but reduction of the dose to an amount equivalent to 5,000 to 10,000 U. S. P. units of vitamin A daily usually leads to a reduction to normal limits of the carotene content of the blood serum. Vitamin A could be administered instead of carotene without any untoward effect. Vitamin B₁ has been thought to possess some untoward effects when administered in amounts of 10 to 20 mg. or more daily. C. A. Mills (Thiamine Overdosage and Toxicity, THE JOURNAL, May 3, 1941, p. 2101) observed symptoms similar to those obtained in cases of hyperthyroidism, but other investigators who have administered large doses of thiamine hydrochloride to patients have not observed these effects.

Large doses of vitamin C have been reported to have a slight sedative effect, but this is not well established. There is some evidence that moderately large doses of vitamin D are not as beneficial to infants as doses which more nearly meet the

requirements for this vitamin, which are about 400 U. S. P. units daily. However, a definitely toxic effect has not been noted with vitamin D except when the substance is given in large doses, such as 50,000 or 100,000 U. S. P. units daily. Administration of large amounts of vitamin D in the form of irradiated ergosterol is known to be beneficial in the treatment of hypoparathyroidism because the blood serum calcium level is raised toward normal. Toxic effects have not been reported for moderate doses of vitamin E or of riboflavin. Many persons who are given 50 mg. or more of nicotinic acid will show peripheral vasodilatation with flushing and sweating, but these effects are not observed if nicotinic acid amide is used. Nicotinic acid occurs in liver largely as the amide of nicotinic acid rather than as the free acid itself.

From the foregoing data there is real reason to administer the vitamins in amounts of the same order of magnitude as the daily dietary requirements.

Overirradiation of ergosterol results in the formation of a toxic substance called toxisterol. The present day manufacture of irradiated ergosterol is generally sufficiently well controlled to guard against this possibility.

OBSCURE URTICARIA AND ANGIONEUROTIC EDEMA

To the Editor:—A married woman aged 34 had generalized urticaria, which after twenty-four hours involved about half the body surface. There was epigastric distress followed by a convulsive seizure. There were tonic contractions of the calf and forearm muscles typical of a carpopedal spasm, accompanied by working of the face muscles and some difficulty of speech. Massage of the extremities, which felt numb, and the administration of oxygen caused some relaxation. She was given 1 cc. of epinephrine hydrochloride followed by 10 cc. of calcium gluconate intravenously. The acute symptoms were promptly relieved and the urticaria disappeared fairly rapidly. The pulse rate was 116 and the blood pressure 136 systolic and 90 diastolic during the attack. Five hours later she felt fairly well. The pulse rate was 104 and the blood pressure 124 systolic and 76 diastolic, but some further urticaria was developing. Fourteen hours after the first attack the urticaria had increased and the epigastric distress had reappeared. An intramuscular injection of 1 cc. of 1:1,000 epinephrine hydrochloride was given and was promptly followed by another convulsive seizure similar to but of shorter duration than the first. Oxygen appeared to give some relief. Both attacks were accompanied by considerable increase in urinary excretion. Several short attacks occurred on the way to the hospital. The patient was given a series of infusions and calcium gluconate and was discharged after five days with the condition undiagnosed. There were no convulsions or urticaria during this period. Blood counts and urinalysis were normal. In the two day period before the onset of symptoms the only items of diet other than what was usual were some fresh peaches and two capsules of a proprietary vaccine for colds and other infections. The past history is essentially negative. Physical examination between the attacks was negative. Could this have been an acute allergic reaction, perhaps to something in the diet, with a cerebral angioneurotic edema causing the muscular spasms and possibly by irritation of the pituitary causing the polyuria? What further investigations can be suggested?

John F. Dixon Jr., M.D., Garden City, N. Y.

ANSWER:—The case described is one of acute urticaria or angioneurotic edema. The epigastric distress is a common feature of such attack, since the edematous lesions frequently involve the gastrointestinal tract. Furthermore, areas of localized edema may occur in other portions of the blood, producing variable combinations of symptoms, such as cerebral and laryngeal, depending on the organs involved. Increased urinary excretion is a demonstrable feature during some stage of the allergic attack such as asthma and urticaria. The concept of pituitary involvement need not be seriously considered as an explanation of the polyuria. The only unusual feature of the attacks described is the tetany. Cerebral symptoms such as unconsciousness, epileptiform convulsions and even tetany have been described as part of acute and violent allergic reactions, usually consequent on the injection of allergens, the ingestion of allergenic foods or as a part of serum sickness. A number of possible explanations can be advanced for the phenomenon of tetany depicted in this case. A parathyroid deficiency or a hypocalcemia may be considered. Angioneurotic edema of the brain or cerebral anemia due to angiospasm is a possible factor. Anoxemia also suggests itself because of the beneficial effect of oxygen inhalations. In the second attack the tetany followed the injection of epinephrine hydrochloride. That this drug can produce tetany has been noted previously.

The entire picture is suggestive of an acute allergic reaction. Hysteria and other psychoneurotic phenomena may be safely excluded as a cause for the syndrome. In speculating on the possible specific allergic cause the acuteness of the attacks would speak in favor of extrinsic allergy. Is it possible that the patient had received any injections shortly before these attacks? Has she used a vaginal douche or contraceptive prepa-

ration, many of which could contain allergenic substances? Drugs taken by mouth should also be considered. Foods can also constitute a cause of such reactions. The proprietary vaccine should also be suspected. In addition there is some degree of possibility that internal allergens, particularly in the form of parasites such as roundworms or tapeworms, may be a cause of such allergy.

A blood calcium and phosphorus determination would be advisable. The patient should be questioned thoroughly about events, diet and so on immediately preceding the attacks. If that fails to point to a clue, cutaneous tests with likely allergens such as foods and extracts of parasites should be made. In the event that these procedures do not disclose the cause of the allergy, help may be obtained from the use of a diary by which the patient keeps record of the foods, drink and drugs ingested in order that a possible correlation with recurring attacks may be ascertained.

ASPIRATION OF BARIUM SULFATE INTO TRACHEA

To the Editor:—In the course of esophageal studies performed on a patient 70 years of age complaining of dysphagia, an esophagram taken showed reflux of barium sulfate into the trachea and bronchi. There was no evidence of esophageal abnormality nor was there evidence of a pathologic condition in the pharynx or larynx. Has regurgitation of barium into the trachea been described in an adult presenting no evidence of esophageal disease? Please quote references.

M.D., New York.

ANSWER.—Aspiration of fluids or solids into the trachea and bronchi may occur rarely in a normal person. When it does occur, it is usually during deep and sudden inspiration such as that following a cough or sneeze. The reason for the momentary and partial failure of the normal protective mechanism to function is not always clear. While it is entirely possible for barium to pass into the lower respiratory tract in a normal person accidentally, this has not been reported. Roentgenologists have occasionally noted that immediately after swallowing a barium sulfate meal a patient may gag and cough violently. When the examination is resumed, no barium is demonstrable in the trachea or bronchi. It may be assumed that in some of these cases barium entered the trachea. In this event the barium must have been expelled during the subsequent coughing spell.

If radiopaque material is found in the lower part of the respiratory tract after a barium meal it is generally considered conclusive evidence of a pathologic condition. The site of the primary disorder may be in the air or food passages, in neighboring structures or in organs which secondarily involve the air or food passages, or there may be some peripheral or central neurologic lesion which by reason of anesthesia, paralysis or incoordination interferes with the complicated series of movements and reflexes of normal deglutition. These possibilities merit serious consideration in a patient with dysphagia who has been apparently observed to have either leakage or aspiration of barium into the lower respiratory tract. The following references may be found helpful, although none mention the presence of barium in the trachea or bronchi of a normal person:

Barclay, A. E.: *The Digestive Tract: A Radiological Study of Its Anatomy, Physiology and Pathology*, London, Cambridge University Press, 1933.

Vinson, P. P.: *The Diagnosis and Treatment of Diseases of the Esophagus*, Springfield, Ill., Charles C. Thomas, Publisher, 1940.

Jackson, Chevalier, and Jackson, Chevalier L.: *Diseases of the Air and Food Passages of Foreign Body Origin*, Philadelphia, W. B. Saunders Company, 1936.

COLD ALLERGY DUE TO ICE BAG

To the Editor:—A woman aged 69, who has had anginal attacks for thirteen years, was directed to apply an ice bag to her precordial area. When seen a few hours later the area was reddened as one would expect with an ice bag. The following day intense local pain developed in the skin, following which there was a diffuse coagulation of the subcutaneous tissue over the entire area in contact with the ice bag. I have heard of ice burns, but I have never seen a coagulation of tissue such as this, in which there was a hard, almost stony, feel to the tissue involved. The resolution has been extremely slow. Can you suggest a reference concerning this condition? What would be the scientific name for the pathologic condition involved?

M.D., Pennsylvania.

ANSWER.—This description seems to portray an allergic reaction. Two possibilities suggest themselves. The most likely cause would seem to be a "cold allergy." This was first described by Horton and Brown in the *American Journal of the Medical Sciences* in 1929. Horton and Roth have subsequently published articles dealing with the same subject.

The second and much less likely possibility is a sensitiveness to the material of which the ice bag was composed. It does not seem likely that the cold was severe enough to produce an "ice burn," which is actually a freezing of the skin.

URTICARIA FOLLOWING INJECTION OF BISMUTH IN PEANUT OIL

To the Editor:—A white woman aged 38 was found to have asymptomatic neurosyphilis by a recent routine serologic and spinal fluid examination. There is no history of any antisyphilitic therapy. She was given bismuth subsalicylate in peanut oil intramuscularly. Following the third weekly injection there developed a generalized urticarial eruption, which persisted until about the time of the next weekly injection. This too produced an urticaria. Treatment with this drug was discontinued, and arsenicals were started. There is no history of any allergic state; the patient never had any urticarial eruption before; she eats peanuts without any cutaneous eruption. Is it possible that her sensitivity is due to the peanut oil of the medication? Would you advise changing to a soluble bismuth compound for the next bismuth course?

M.D., New York.

ANSWER.—It is possible that the patient is sensitive to peanut oil. The information supplied is too scanty for adequate opinion. It would be advisable to get a small amount of peanut oil, sterilize it by boiling and inject a small amount and find out if she is sensitive. It is to be doubted that the urticaria is due to the bismuth itself, though it is a possibility.

Diagnosis of asymptomatic neurosyphilis suggests that the patient does not have any cardiovascular manifestations. Nevertheless she should not be put on arsenical therapy for some little time. It is better to put such a person on bismuth therapy, at least for a course of treatment. An intramuscular injection of iodobismutol 2 cc. twice a week, using the buttocks alternately and continuing this therapy for a period of ten weeks, may be tried. The patient may complain a little of discomfort from this preparation, but if the area of injection is massaged well after the injection there should be little difficulty.

If, following the injection of the iodobismutol, the urticaria returns, it would look more like a true urticarial eruption from bismuth, which is certainly rare.

WHOOPIING COUGH VACCINE AND ASTHMA

To the Editor:—Several patients have asked me about the danger of asthma occurring later in life following the use of injections of pertussis vaccine. Is there any scientific basis for this belief?

C. L. Hannum, M.D., Plymouth, Ohio.

ANSWER.—Whooping cough vaccine for immunization made with human blood contains no animal protein and could neither sensitize an infant nor cause asthma later in life. For minimal local or febrile reaction, Sauer recommends the new 15,000 million per cubic centimeter Hemophilus pertussis vaccine, immunizing, prepared under the control of Northwestern University Medical School. Absorption is delayed when it is injected hypodermically in the region of the deltoid insertion. A subcutaneous lump should be visible when the needle is withdrawn. The preferred interval between the three injections is three weeks; the preferred age is the eighth month of life.

TREATMENT OF SENILE ECZEMA

To the Editor:—Is there any new treatment for senile eczema manifested by weeping and crusting of the legs on the front of the ankles and up to the knees?

K. O. Ohme, M.D., Mitchell, Neb.

ANSWER.—Wet compresses of dilute solution of aluminum subacetate, using 1 ounce of aluminum subacetate solution to the pint of cool water and applying these compresses several times daily for one hour at a time, are often of value. In the interim the use of a crude coal tar ointment is helpful. This may be made up according to the following formula:

	Gm. or Cc.
Crude coal tar.....	2
Solution of aluminum acetate.....	5
Wool fat.....	10
Lassar's paste.....	to make 30

When the patient is on his feet a protective bandage, such as an Ace or Tetra bandage, should be applied. Soap and water should not be applied to the affected areas and the parts should be cleansed with a bland oil.

HEALED DEFECT IN OS CALCIS AFTER OSTEOMYELITIS

To the Editor:—A man aged 40 who had an acute hematogenous osteomyelitis of the os calcis made a full recovery, but the defect in the bone persists as shown by radiographic examination. Will this defect fill in? Can information be found in the literature? What is the experience in these cases?

M.D., North Dakota

ANSWER.—When a defect of the bone is present following an acute osteomyelitis in the os calcis of an adult, it is practically certain to persist. It may fill in somewhat, but the probabilities are that the cavity will remain.

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THE LIVER AND MEDICAL PROGRESS

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It is an essential but almost impossible task for the physician to keep himself sufficiently informed concerning the discoveries in the several sciences that are included in the science of medicine to use intelligently the practical results of these discoveries in his clinical work. From the biologic, chemical and physical laboratories in addition to the research clinic and bedside of the patient there issues a flood of discoveries which is almost overwhelming. If the physician is to render to his patient of today the benefit of the discovery of yesterday, the new accretions to the knowledge and practice of medicine must be evaluated, organized and assimilated within the background of his previous training and experiences. His ability to apply the results of the investigations in the various fields of medicine will depend on his knowledge of the fundamental sciences and the advances made in them as well as on his clinical training and acumen.

The following brief review of some of the functions of the liver has been prepared in conformity with the foregoing considerations. The liver has many functions, and hepatic activity is a part of a large number of the important physiologic processes occurring in the body. Because of these manifold activities the liver is involved in a considerable number of the discoveries which constitute the substance on which the practice of medicine progresses. Accordingly an attempt is made to achieve a dual purpose in this paper: (1) to present the more significant functions of the liver and (2) to emphasize the important role of the liver in medical science by citation of some recent advances in diverse fields directly or indirectly related to the organ. No attempt is made to present a complete review of the available material in regard to either objective, and the subject is too broad in relation to space to permit citation of more than the more pertinent references.

PHYSIOLOGIC ANATOMY

While the anatomy of the liver is too well known to deserve comment, four anatomic characteristics should be noted because they are pertinent to a discussion of the functions of the organ: 1. The liver is the largest organ in the body. 2. The organ has a dual blood supply, one arterial and the other venous.

3. Cytologically the organ contains predominantly two cell types, the hepatic cell and the stellate cell, which have separate functions. 4. Histologically the hepatic tissue is composed of units organized to favor an especially intimate relationship between the parenchymal cells and a generous supply of blood and to supply a duct system adequate to accommodate the secretion of bile.

MAINTENANCE OF THE AMOUNT OF HEPATIC TISSUE

The liver has several general characteristics which are important in relation to its functional activities, but only one of these will be emphasized. The organ possesses an astounding capacity for restoration after injury or loss of a portion. This characteristic of hepatic tissue becomes increasingly significant in relation to the growing knowledge concerning the pathologic reactions occurring in the organ. Many of the changes noted in pathologic conditions of the liver and the persistence of functioning hepatic tissue in opposition to exceedingly adverse conditions are due to this almost irresistible urge of the hepatic tissue to be restored.

FUNCTIONS OF THE LIVER

The more important of the known physiologic activities of the liver are outlined as follows:

Secretion of Bile.—The secretion of the liver, bile, is normally formed continuously, but the rate of secretion may be accelerated by physiologic stimulants, such as certain foods and notably the bile acids. Bile contains several substances, of which four, water, bile pigment, bile salts and cholesterol, are found in the largest amounts. Bile pigment is made from hemoglobin (blood and muscle) by the reticuloendothelial cells located throughout the body but mainly in spleen, bone marrow and liver and, under normal conditions, is excreted through the intestine as a waste product. Bile salts are formed in the liver and, under certain conditions, appear to be destroyed in the organ. Cholesterol, the substance most commonly found in diseases of the biliary tract, is a physiologic enigma in regard to its secretion by the liver and presence in the bile. Besides being the medium for the excretion of bile pigment, bile has important functions in relation to digestion. It is one of the secretions which serve to dilute, buffer and neutralize the acidity of the gastric contents which reach the duodenum. The bile salts are important for the normal digestion and absorption of fat and are especially valuable in the absorption of the fat-soluble vitamins.

Hepatic Activities in Relation to the Foodstuffs.—Hepatic activities in relation to the foodstuffs appear to begin immediately after the ingestion of food. Not

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only does the liver exhibit gross changes such as relate to size and color, but more careful observation indicates that it undergoes a definite diurnal cycle in regard to size and weight which appears to depend on the food products reaching it and is due mainly to variations in its content of water and glycogen and possibly fat and protein.

The liver has three major activities in relation to the utilization of food, which are (1) storage of food-stuffs, (2) manufacture of food materials and (3) regulation of the latter. Carbohydrate in the form of glycogen and fat in various forms can be stored in the organ in relatively large amounts up to 20 per cent of glycogen and 40 per cent of fat. Some evidence would indicate that a storage form of protein also exists in the hepatic cells. Certain sugars and possibly some substances originating from fat are converted by the liver from a nonutilizable form to one that can be used by the tissues. Amino acids are deaminized by the liver, and the nitrogenous portion is converted into urea by the hepatic cells. The organ has a vital function in the regulation of the dextrose content of the blood and may possibly be of significance in regard to control of the supply of protein and fat to the tissues by mobilization of its content of these two materials.

Storage.—The relatively large amount of hepatic tissue has been considered as indicative of the great capacity of the liver for storage, and evidence would suggest that this function of the organ has not been overemphasized. In addition to the storage of food-stuffs, the hepatic cells are the site of storage for many other important substances such as certain vitamins and the factor essential in the treatment of pernicious anemia. Several metals, notably iron, are retained in the liver, mainly within the reticuloendothelial cells.

Synthesis.—The liver appears to be the site of origin for several important physiologic substances. Among these should be mentioned heparin, the plasma proteins and some of the essential factors for the coagulation of the blood, such as fibrinogen or its precursor and prothrombin.

Detoxicating Function.—While the detoxicating function of the liver may have been overemphasized in the past, there appears to be no question in regard to hepatic activity protecting the organism from some harmful substances which may originate within the body or reach the blood stream from the outside. Certain alkaloids such as strychnine and nicotine are for the most part destroyed in the liver. Many substances are made innocuous by conjugation, a process which appears in many instances to occur in the liver. The organ may protect the body from toxic substances in other ways than by actual destruction. Some such substances are excreted in the bile; others may be held temporarily in the hepatic cells and released in amounts too small to be injurious to other more vulnerable sites of action.

From the preceding review of hepatic activities, even though brief and incomplete, it is clearly evident that the liver has a part in a large number of physiologic processes. It is also apparent that the practice of medicine requires an awareness of the liver and that the possibility of a hepatic factor in the newer phases of medical science must always be considered. A few illustrative examples can be cited.

SOME RECENT ADVANCES CONCERNING THE LIVER AS AN ORGAN

Circulation and Flow of Blood.—The unique circulation of the liver is one of the important factors conditioning the character and capacity of the functional activities of the organ. Several investigations on the hepatic circulation have been made in this laboratory, of which a few will be mentioned.

The Circulation in Relation to Hepatic Restoration.—The partial removal of the liver is followed by complete restoration of hepatic tissue within a fairly definite period. It has been proved that this hepatic restoration depends almost completely on the supply of portal blood to the organ because it occurs to only a slight extent when this portion of the hepatic circulation has been diverted from passing through the organ.¹ Evidence indicates that restoration of liver tissue after hepatic injury also depends to a considerable extent on the portal blood flow.

The Intrahepatic Circulation of Blood.—As previously mentioned, the liver differs in one important respect from all other organs of the body; namely, it possesses both an arterial and a venous supply of blood. The intrahepatic course of these two sources of blood, their relative functions in relation to the hepatic cell, and where they join to enter the common channel, the central vein of the lobule, have been significant but unanswered questions. The investigations of Wakim² have answered some of these questions. Using a modification of the transillumination method of Knisely,³ he studied the intrahepatic circulation of blood in the frog and the rat. He observed that the intrahepatic circulation is intermittent, with phases of circulatory activity in the sinusoids alternating irregularly with phases of inactivity. During circulatory inactivity the sinusoids may either go through a storage phase during which they are packed full of blood cells or go through a nonstorage phase during which they contain very few blood cells. The liver normally possesses a high circulatory functional reserve. Arteriovenous anastomoses were found between the branches of the hepatic artery and portal vein. The hepatic artery was found to supply arterial blood to the hepatic parenchyma through several routes: (1) arterial terminals emptying directly into the sinusoids, (2) arterial branches emptying into the radicles of the portal vein proximal to the sinusoids and (3) arteriovenous anastomosis between the two vessels proximal to the sinusoids. Almost all the hepatic parenchyma was supplied with blood from the portal vein, but some regions appeared to have only an arterial supply. These observations on the intrahepatic circulation give promise of being of aid in determining the specific localization of sites of injury caused by some hepatic toxins.

The Liver as a Storage Reservoir for Blood.—The relatively large capacity of the sinusoids of the liver as well as the results of studies on changes in volume of the organ suggests the possibility that the liver may be an important site for storage of blood. The results of some studies by Grindlay, Herrick and me⁴ on the flow of

1. Mann, F. C.: The Portal Circulation and Restoration of the Liver After Partial Removal, *Surgery*, 8: 225-238 (Aug.) 1940.

2. Wakim, K. G.: The Intrahepatic Circulation of Blood in the Intact Animal: Preliminary Report, *Proc. Staff Meet., Mayo Clin.* 18: 198 (March 26) 1941.

3. Knisely, M. H.: A Method of Illuminating Living Structures for Microscopic Study, *Anat. Rec.* 64: 499-524 (March) 1936.

4. Grindlay, J. H.; Herrick, J. F., and Mann, F. C.: Measurement of the Blood Flow of the Liver, *Am. J. Physiol.* 132: 489-496 (March) 1941.

blood to the liver furnish additional evidence for this view. We measured the flow of blood to and from the liver simultaneously by means of the thermostromuhr and obtained data which indicated that under certain conditions the liver may alternately store blood and discharge stored blood.

The Secretion of Bile.—The most important recent additions to knowledge concerning the secretion of bile have been made by Ivy and his co-workers.⁵ It is unnecessary to review the results of their studies, as Ivy is presenting some of them at this symposium. It should be emphasized that the importance of the clinical conditions associated with impairment of this function of the liver makes continued investigation on it desirable.

INVESTIGATIONS DEALING WITH PHYSIOLOGIC RELATIONSHIPS BETWEEN THE LIVER AND OTHER PARTS OF THE BODY

Diet and the Liver.—The role of the liver in regard to the storage, manufacture and regulation of the food supply to the body makes imperative a close relation between hepatic activity and the character of the food intake. Recent work on this subject has been reviewed by Hawkins.⁶ It would appear desirable for the physician to consider diet in relation to the liver from two points of view: (1) the character of the food that will be most suitable for protecting the organ from stress and (2) the diet that will permit the impaired liver to maintain its function most efficiently. While the results of investigations are not wholly in agreement, it would appear that the liver is best prepared to meet stress when its store of both carbohydrate and protein is ample. The impaired liver appears to function best on a high carbohydrate diet with sufficient protein obtained from simple foods to maintain the requirements of the body for this foodstuff as well as to supply the organ with sufficient amounts for the synthesis of the specific products it elaborates. The results of most investigators are in agreement in one respect: a diet which tends to increase excessively the fat content of the liver is detrimental.

Fat Metabolism and the Fatty Liver.—Knowledge concerning the processes of carbohydrate and protein metabolism has greatly exceeded that in regard to the metabolism of fat. However, owing to the development of more satisfactory chemical methods for the investigation of fat metabolism, data are rapidly accumulating in regard to the utilization of this important foodstuff, and such data would seem to indicate that the liver is important in the metabolism of fat as well as of carbohydrate and protein. Investigations made with this point in view have been done by Dr. Bollman and Dr. Flock in this laboratory. A brief review of the data on this subject, gathered from the results of many investigators, although at present rather confusing, serves to emphasize the role of the liver in relation to fat metabolism.

The ability of the liver to hold widely varying quantities of fat is one of the most striking characteristics of this organ. The concentration of lipids present in the liver at any given time appears to be the resultant

of the influences of many different factors: species of animal, type of diet including vitamin content, hormones and toxic substances.

The concentration of neutral fat in the liver may increase after the administration of many toxic substances, such as chloroform, carbon tetrachloride or phosphorus, which injure the liver cells. Feeding of a high fat diet to mammals results in the storage of an unusually large amount of fat in the liver. Forced feeding of a high carbohydrate diet to birds, such as the goose, results in synthesis and storage of large amounts of liver fat.⁷ Fasting, or feeding of the amino acid cystine, will produce fatty livers. McHenry and his co-workers⁸ have recently shown that vitamins B₁, B₆ and H will increase liver fat in the rat under certain experimental conditions. Thus thiamine or vitamin B₁ administered to rats on a high carbohydrate diet produces an increase apparently due to synthesis of fat from carbohydrate. Pyridoxine or vitamin B₆ as well as thiamine is essential for the synthesis of fat in rats on a high protein diet. Biotin or vitamin H is effective in increasing the amount of liver fat in rats on a low choline, fat-free diet. A hormone in anterior pituitary extracts will produce fatty livers in many animals, whereas the absence of insulin and other constituents of the pancreas produces fatty livers in depancreatized animals. Estrogenic substances will produce very fatty livers in birds.

Substances that will produce a decrease in the neutral fat content of liver under definite experimental conditions are choline, the amino acid methionine, carbohydrate, protein, insulin and other constituents of the pancreas. Choline, methionine, carbohydrate or protein prevents the accumulation of fat due to a high fat diet. Fatty livers which develop in depancreatized dogs maintained with insulin are prevented by choline⁹ or by lipocaic,¹⁰ a water-soluble substance of pancreas. Montgomery, Entenmen, Chaikoff and Nelson¹¹ reported that fatty livers may be prevented in dogs with complete ligation of the pancreatic ducts by feeding of pancreatic juice as well as an extract of pancreas. Fatty livers produced by anterior pituitary extract cannot be prevented by either choline or lipocaic.¹² Fatty livers produced by biotin are prevented by lipocaic but not by choline.

The concentration of cholesterol in the liver tends to vary in the same direction as that of neutral fat under the foregoing conditions but to a smaller degree. Feeding of cholesterol to rabbits, guinea pigs or rats will produce fatty livers in which cholesterol is the predominant lipid.¹³

7. Flock, Eunice V.; Bollman, J. L.; Hester, H. R., and Mann, F. C.: Fatty Liver in the Goose Produced by Overfeeding, *J. Biol. Chem.* **121**: 117-129 (Oct.) 1937.

8. McHenry, E. W., and Gavin, Gertrude: The Effect of Several B Vitamins and of Choline upon Liver and Body Fat, *J. Biol. Chem.* **128**: 1311 (June) 1939. The B Vitamins and Fat Metabolism. IV. The Synthesis of Fat from Protein, *ibid.* **138**: 471-475 (April) 1941; The Effect of Biotin upon the Synthesis of Lipids in Rats, *Proc. Am. Soc. Biol. Chem.* 1941, p. lxxviii.

9. Best, C. H., Ferguson, G. C., and Hershey, J. M.: Choline and Liver Fat in Diabetic Dogs, *J. Physiol.* **79**: 94-102 (July 28) 1933.

10. Dringstedt, L. R.; Van Prohaska, John, and Harms, H. P.: Observations on a Substance in Pancreas (a Fat Metabolizing Hormone) Which Permits Survival and Prevents Liver Changes in Depancreatized Dogs, *Am. J. Physiol.* **117**: 175-181 (Sept.) 1936.

11. Montgomery, M. L.; Entenmen, C.; Chaikoff, I. L., and Nelson, C.: The Role of the External Secretion of the Pancreas in Lipid Metabolism. The Prevention of Fatty Livers in Depancreatized and Duct Ligated Dogs by the Daily Feeding of Fresh Pancreatic Juice, *J. Biol. Chem.* **137**: 693-698 (Feb.) 1941.

12. Mackay, E. M., and Barnes, R. H.: Choline and Pancreas Extract on Fatty Livers and Ketosis Due to Anterior Pituitary Extract, *Proc. Soc. Exper. Biol. & Med.* **35**: 803-805 (June) 1935.

13. Cook, R. P., and McCullagh, G. P.: A Comparative Study of Cholesterol Metabolism and Its Relation to Fatty Infiltration, with Particular Reference to Experimental Cholesterol Atherosclerosis, *Quart. J. Exper. Physiol.* **29**: 283-302 (Aug.) 1939.

5. Kocour, E. J., and Ivy, A. C.: The Effect of Certain Foods on Bile Volume Output Recorded in the Dog by a Quantitative Method, *Am. J. Physiol.* **122**: 325-346 (May) 1938.

6. Hawkins, W. B.: Liver and Bile, *Ann. Rev. Physiol.* **3**: 259-282, 1941.

The total amount of phospholipid in the liver tends to remain relatively constant, although the percentage concentration decreases in the very fatty livers owing to dilution of the liver tissue with neutral fat. The studies of Hevesy and others involving the use of the radioactive isotope of phosphorus indicate that phospholipid turnover in the liver is increased after fat feeding.¹⁴ Experiments by Perlman and Chaikoff¹⁵ demonstrate a definite acceleration in this turnover when choline is fed and a decrease in turnover when cholesterol is fed. Recent experiments by Flock and Bollman¹⁶ suggest that a decided shift in relative amounts of lecithin and cephaline may occur in very fatty liver produced by stilbestrol in birds.

A few tentative conclusions may be made, based on the large but as yet inadequate amount of data concerning the role of the liver in fat metabolism: 1. Many widely different factors can cause great changes in the amount and kind of fat content of the liver. 2. Such changes can occur with great rapidity. 3. Any considerable increase in the fat content of the liver, even an increase produced by physiologic means, impairs the organ in regard to some of its other functions.

Vitamins and the Liver.—There is only suggestive evidence that there is a direct and specific effect of any vitamin deficiency on the liver as an organ. The changes observed can all be produced by reducing food intake, so that it would appear that they are due to anorexia following vitamin deficiency rather than to vitamin lack per se. On the other hand the liver does have an important role in regard to several vitamins, and specific vitamin deficiencies may affect some of its functions. As would be anticipated, its major role appears to be that of storage, and many of the vitamins are found in relatively large amounts in the organ. It also seems to be the site where some of the vitamins produce part of their effects, as was noted in the discussion of fat metabolism.

The intimate relationship of hepatic activity to seemingly extrahepatic processes is illustrated by a brief review of the role of the organ in the utilization of vitamin K.

The chemistry and physiology of vitamin K have recently been reviewed by Almquist¹⁷ and its clinical use has been reviewed by Quick,¹⁸ Snell and Butt,¹⁹ Dam²⁰ and Ferguson.²¹ Vitamin K deficiency in chicks was shown to produce hemorrhage in these animals because of a much reduced level of prothrombin in the blood. Other animals were more resistant to the effects of dietary vitamin K deprivation, but later work has demonstrated prothrombin deficiencies clearly due to dietary K avitaminosis in a number of species of mam-

mals. The relation of the liver to vitamin K was indicated by the prothrombin deficiency in rats, dogs and man deprived of bile by fistula or by biliary obstruction. This relationship depended on the necessity of bile in the gastrointestinal tract for the absorption of the vitamin contained in food or of vitamin concentrates. The feeding of bile or bile salts with diets containing vitamin K was sufficient to relieve the hypoprothrombinemia. Certain synthetic water-soluble vitamin K compounds are efficiently absorbed and are effective in the absence of bile from the intestine.

Severe hepatic damage is usually associated with hypoprothrombinemia. In chloroform²² and carbon tetrachloride²³ injury to the liver, the hypoprothrombinemia is not altered by administration of large amounts of vitamin K. The severely damaged liver seems unable to maintain the prothrombin level of the blood even when vitamin K is available. The loss of prothrombin from the blood that occurs after removal of the liver is likewise uninfluenced by the administration of vitamin K.²⁴ From the data available it may be concluded that the liver is responsible for the formation of prothrombin and that prothrombin formation may be prevented either by injury to the liver or by deficiency of vitamin K.

The Liver and the Endocrines.—Hepatic activity appears to be altered, either directly or indirectly, by many of the hormones. However, the amount of data on this subject is too large to review and the character of the data too difficult to evaluate in the allotted space. Suffice to repeat the statement made in a previous paper:²⁵ "Hepatic activity can be changed by hormones in the following respects: (1) by an effect on the rate of body metabolism, (2) by an effect on the intrinsic mechanism of the liver, either for storage or manufacture of food, and (3) by an effect on the amount of available food materials reaching the liver." Evidence is accumulating which indicates that the functions of the liver may be altered by different hormones in each of the respects mentioned.

Hepatic Function in Relation to Anesthesia.—It has been recognized for many years that certain anesthetic agents, notably chloroform, produce injury to the liver but the subject seemed to be of sufficient current interest for a recent reviewer of hepatic function to reemphasize it.⁶ It is not so well known that the liver may be an important site for the destruction of some anesthetic substances. For example, it has been shown that the liver detoxicates procaine much more rapidly and efficiently than do other tissues.²⁶

An ingenious method for investigating the question of whether or not anesthetic agents are destroyed or prevented from acting by the liver has been devised by Scheiffley and Higgins,²⁷ using the partially hepatectomized rat as a test object. It had been found that restoration of the liver of the rat after partial removal

14. Artom, C.; Sarzana, G.; Perrier, C.; Santangelo, M., and Segre, E.: Phospholipid Synthesis During Fat Absorption, *Nature*, **139**:1105-1106 (June 26) 1937. Perlman, I.; Ruben, S., and Chaikoff, I. L.: Radioactive Phosphorus as an Indicator of Phospholipid Metabolism: I. The Rate of Formation and Destruction of Phospholipids in the Fasting Rat, *J. Biol. Chem.*, **122**:169-182 (Dec.) 1937.

15. Perlman, I., and Chaikoff, I. L.: Radioactive Phosphorus as an Indicator of Phospholipid Metabolism: V. On the Mechanism of the Action of Choline upon the Liver of the Fat-Fed Rat, *J. Biol. Chem.*, **127**:211-220 (Jan.) 1939; Radioactive Phosphorus as an Indicator of Phospholipid Metabolism: VII. The Influence of Cholesterol upon Phospholipid Turnover in the Liver, *ibid.*, **128**:735-743 (June) 1939.

16. Flock, Eunice V., and Bollman, J. L.: Unpublished data.

17. Almquist, H. J.: Vitamin K, *Physiol. Rev.*, **21**:194-216 (Jan.) 1941.

18. Quick, A. J.: A Classification of Hemorrhagic Diseases Due to Defects in the Coagulation Mechanism of the Blood, *Am. J. M. Sc.*, **199**:118-132 (Jan.) 1940.

19. Snell, A. M., and Butt, H. R.: Supplementary Report on Vitamin K, *J. A. M. A.*, **113**:2056-2059 (Dec. 2) 1939.

20. Dam, H.: Fat-Soluble Vitamins, *Ann. Rev. Biochem.*, **9**:353-382, 1940.

21. Ferguson, J. H.: Blood, Coagulation, Biophysical Characters and Formed Elements, *Ann. Rev. Physiol.*, **2**:71-108, 1940.

22. Smith, H. P.; Warner, E. D., and Brinkhous, K. M.: Prothrombin Deficiency and the Bleeding Tendency in Liver Injury (Chloroform Intoxication), *J. Exper. Med.*, **66**:801-811 (Dec.) 1937. Brinkhous, K. M., and Warner, E. D.: Effect of Vitamin K on Hypoprothrombinemia of Experimental Liver Injury, *Proc. Soc. Exper. Biol. & Med.*, **44**:609-610 (June) 1940.

23. Bollman, J. L.; Butt, H. R., and Snell, A. M.: The Influence of the Liver on the Utilization of Vitamin K, *J. A. M. A.*, **115**:1087-1090 (Sept. 28) 1940.

24. Andrus, W. DeW.; Lord, J. W., Jr., and Moore, R. A.: The Effect of Hepatectomy on the Plasma Prothrombin and the Utilization of Vitamin K, *Surgery*, **6**:899-900 (Dec.) 1939.

25. Mann, F. C.: The Role of the Liver as the Commissariat of the Body, *Am. J. Digest. Dis. & Nutrition*, **4**:355-364 (Aug.) 1937.

26. Dunlop, J. G.: The Fate of Procaine in the Dog, *J. Pharmacol. & Exper. Therap.*, **55**:464-481 (Dec.) 1935.

27. Scheiffley, C. H., and Higgins, G. M.: The Effect of Partial Hepatectomy on the Action of Certain Barbiturates and a Phenylurea Derivative, *Am. J. M. Sc.*, **200**:264-268 (Aug.) 1940.

of the organ (approximately 70 per cent) began toward the end of the first twenty-four hours and that the remainder more than doubled itself in seventy-two hours with complete restoration of the ratio of liver weight to body weight by ten to fourteen days. If the liver protects the body against any particular substance, a removal of a portion of the organ should increase the action of the substance and, conversely, restoration of the liver should cause a corresponding decrease in its effect.

Employing a standard method of procedure in regard to dosage, method of administration and time of administration after operation, Scheifley and Higgins found that the duration of anesthesia produced by pentobarbital sodium was definitely prolonged after partial removal of the liver and decreased as the organ was restored. The action of pentothal sodium was not altered by the loss of hepatic tissue. The results of these experiments indicate that the liver protects the body against the action of pentobarbital sodium but does not protect against the action of pentothal sodium. The clinical application of results of investigations such as the foregoing from the standpoint of both the anesthetist and the surgeon has recently been briefly but pertinently reviewed by Lundy and his associates.²⁸

The Role of the Liver in Anaphylaxis.—Since anaphylactic shock was first observed, investigators have searched for the mechanism by which the symptoms of the reaction are produced. Pioneer investigators²⁹ of the problem noted the two most outstanding features of anaphylactic shock in the dog, namely the fall in blood pressure and the reduced coagulability of the blood, and suggested that the fall in blood pressure might be due to the liberation of a tonic substance. In the dog, the liver was soon implicated as a possible source of the tonic substance. It was found, by cross circulation methods, that when a normal dog was given blood from an anaphylactic animal signs of anaphylaxis³⁰ developed and that exclusion of the liver from the circulation in a sensitized dog prevented the usual anaphylactic reaction when the antigen was administered.³¹ The importance of the presence of the liver in anaphylactic shock in the dog was corroborated and emphasized by the studies of several investigators.³² It became clear that during anaphylactic shock in the dog the liver became greatly congested and that the blood leaving the liver possessed blood pressure lowering properties. Waters and Markowitz³³ recently found in acute experiments in which the animal was under ether anesthesia that sensitized dogs show a fall in blood pressure after injection of antigen, even when the liver has been removed.

The problem was considerably clarified by the demonstration that histamine or a histamine-like substance

is present in the blood of the dog during anaphylactic shock. First, Dragstedt and his co-workers³⁴ showed very clearly that a vasoactive substance was present in high concentrations in blood taken from the supra-diaphragmatic portion of the inferior vena cava. They seldom found this activity in the more peripheral blood. Anatomically their studies indicated the liver as a likely source of the active substance. Extensive investigations of the properties of the active substance allowed them to conclude that it was histamine. More recently Code,³⁵ using a quantitative method of estimation, found that histamine is liberated into the blood stream in relatively high concentrations during acute anaphylactic reactions in the dog and the guinea pig. Using the same method, Ojers, Holmes and Dragstedt³⁶ found that in the dog the histamine content of the liver is reduced during anaphylactic shock. The balance of evidence to date suggests that much of the histamine liberated into the blood during anaphylaxis in the dog comes from the liver. No such decisive evidence in respect to the importance of the role of the liver during anaphylaxis has been advanced for other animal species.

While the increased concentration of histamine found in the blood during anaphylactic shock in the dog readily explains the fall in blood pressure which occurs during the reaction, it does not solve the problem of the decreased coagulability of the blood. In their early work Biedl and Kraus had pointed out this important change, and one of the early stumbling blocks in the histamine hypothesis of anaphylactic shock was the fact that histamine itself has no effect on blood coagulability. The reduced coagulability of the blood has been shown by Jaques and Waters³⁷ to be due to a liberation of heparin into the blood stream, and this presumably is derived from the liver.

Liver Function Tests.—A discussion of functional tests of the liver does not come within the scope of this paper, but since all such tests should have a basis on established physiologic function a few brief statements of physiologic consideration in regard to functional tests may be of value. In this connection it should be emphasized that the liver is a very dynamic organ, and both the character of its function and the capacity for any particular function vary greatly within relatively short intervals of time. It should also be noted that there is a dissociation of function of the liver, so that injury may impair one function to a greater extent than other functions. Normal physiologic conditions may impair some of the hepatic functions, as was previously noted in regard to a fat diet producing an increase in fat content of the liver and a decrease in some hepatic functions. Hepatic injury may be followed by restoration of hepatic tissues without apparent loss of hepatic function. Only a small amount of normal hepatic tissue may maintain normal hepatic activities under protection from functional stress.

28. Lundy, J. S.; Tuohy, E. B.; Adams, R. C., and Mousel, L. H.: Clinical Use of Local and Intravenous Anesthetic Agents: General Anesthesia from the Standpoint of Hepatic Function, Proc. Staff Meet., Mayo Clin. 16: 78-80 (Jan. 29) 1941.

29. Biedl, A., and Kraus, R.: Experimentelle Studien über Anaphylaxie, Wien. klin. Wchnschr. 22: 363-370 (March 18) 1909.

30. Manwaring, W. H.: Serophysiologische Untersuchungen: 1. Der physiologische Mechanismus des anaphylaktischen Schocks, Ztschr. f. Immunitätsforsch. u. exper. Therap. 8: 1-24 (Nov. 7) 1910.

31. Manwaring, W. H.; Hoesepian, V. M.; O'Neill, F. I., and Moy, H. B.: Hepatic Reactions in Anaphylaxis: X. The Hepatic Anaphylatoxin, J. Immunol. 10: 575-581 (May) 1925.

32. Voegtlin, Carl, and Bernheim, B. M.: The Liver in Its Relation to Anaphylactic Shock, J. Pharmacol. & Exper. Therap. 2: 507-511 (July) 1911. Denecke, Gerhard: Ueber die Bedeutung der Leber für die anaphylaktische Reaktion beim Hunde, Ztschr. f. Immunitätsforsch. 20: 501-520 (Jan. 22) 1914. Weil, Richard: Studies in Anaphylaxis: XXI. Anaphylaxis in Dogs: A Study of the Liver in Shock and in Peptone Poisoning, J. Immunol. 2: 525-556 (Oct.) 1917.

33. Waters, E. T., and Markowitz, J.: Typical Anaphylaxis in the Dog in the Absence of the Liver, Am. J. Physiol. 130: 379-383 (Aug.) 1930.

34. Dragstedt, C. A., and Gebauer-Fuehlberg, Erich: Studies in Anaphylaxis: I. The Appearance of a Physiologically Active Substance During Anaphylactic Shock, Am. J. Physiol. 102: 512-519 (Nov.) 1932. Gebauer-Fuehlberg, Erich, and Dragstedt, C. A.: Studies in Anaphylaxis. II. The Nature of a Physiologically Active Substance Appearing During Anaphylactic Shock, ibid. 102: 520-526 (Nov.) 1932. Dragstedt, C. A., and Mead, F. B.: Further Observations on the Nature of the Active Substance ("Anaphylotoxin") in Canine Anaphylactic Shock, J. Immunol. 30: 319-326 (April) 1936.

35. Code, C. F.: The Histamine Content of the Blood of Guinea Pigs and Dogs During Anaphylactic Shock, Am. J. Physiol. 127: 78-93 (Aug.) 1939.

36. Ojers, Gaylor; Holmes, C. A., and Dragstedt, C. A.: The Liver Histamine in Canine Anaphylaxis, read before the American Society for Pharmacology and Experimental Therapeutics, Chicago, April 15, 1941.

37. Jaques, L. B., and Waters, E. T.: The Isolation of Crystalline Heparin from the Blood of Dogs in Anaphylactic Shock, Am. J. Physiol. 129: P369-P370 (May) 1940.

CONCLUSION

From the foregoing statements regarding hepatic activity it would appear from a physiologic point of view that the results of functional tests may vary in relation to tissues and that such slight variation in procedure as changes in diet and length of fast preceding test may alter the results of the test. One test may show a normal function, while another would indicate impairment of function. It is possible that only a test which placed considerable physiologic stress on the organ would indicate impairment of function even though the organ might be badly injured.

SURGICAL MANAGEMENT OF DISEASE OF THE GALLBLADDER

AS CORRELATED WITH NEWER PHYSIOLOGIC CONCEPTS

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The application of physiologic principles in the management of patients with disease of the gallbladder has affected the preoperative and postoperative care, mortality and general end results. During the past ten years these advances have caused us to change or to augment, from time to time, our existing management of surgical patients with disease of the biliary tract.

PREOPERATIVE AND POSTOPERATIVE CARE OF THE POOR RISK PATIENT

While patients with simple uncomplicated disease of the gallbladder without ductal or hepatic involvement may require but little preparation for surgery, those with long-standing disease of the gallbladder, jaundice or a history of jaundice or recurrent infection or obstruction of the biliary tract or liver will require time for surgical preparation. Tests of hepatic function, such as the test with hippuric acid,¹ the rose bengal² or the galactose tolerance test,³ should be carried out repeatedly on all patients who are poor surgical risks. Ravdin⁴ and Althausen⁵ pointed out that a high carbohydrate, low fat diet, adequate in proteins, may be efficacious in protecting the integrity of the hepatic cells, while a high concentration of hepatic lipids predisposes to cellular necrosis. The correction of vitamin deficiencies is particularly important, as it has been shown that the storage of vitamins in the liver is affected by the presence of hepatic damage.⁶ Deficiencies of vitamins B and C are common in all surgical patients.⁷ Vitamin B₁,

thiamine hydrochloride, may be rapidly destroyed in the presence of an injured liver and yet is necessary for the utilization of carbohydrates.⁸ Bile salts are essential for the intestinal absorption of the fat soluble vitamins A, D, E and K from the diet. They also are necessary to promote secretion of bile by the liver, enhance absorption of iron and calcium and augment peristaltic activity.⁹ In the presence of external biliary fistula or obstructive jaundice, natural bile salts should be used for absorptive purposes. Under these circumstances the liver is able to secrete bile pigment, though it is not capable of excreting bile salts. After complete obstruction of the common bile duct or an external biliary fistula has been present for from ten days to two weeks, the bile will contain little or no bile salts.¹⁰ Rather than refeed the patients their own bile, which is a disagreeable procedure and of little benefit, one should administer those natural bile salts which promote the intestinal absorption of fats, such as desoxycholic acid, bilron, descol, bilein or degalol. The choleric action of bile salts following surgery of the common duct may be of value in flushing the extrahepatic bile ducts of debris, clots, small precipitates or even small calculi.¹¹ The hydrocholeric activity of oxidized unconjugated dehydrocholic or ketocholic acids, as decholin, procholol or ketochol, increases the volume, thins the bile and has the least toxic effect.¹² The prothrombin level in the blood should be determined for all patients who are poor surgical risks, in an attempt to recognize the hemorrhagic tendency,¹³ which should be combated by the oral administration of natural¹⁴ or intravenous use of synthetic vitamin K preparations¹⁵ (naphthoquinone derivatives) and transfusions of fresh blood both before and after operation.

Fluid and electrolyte balance must be restored in order to prevent dehydration, restore glycogen to the liver and bring about a favorable exchange between cellular and tissue fluids as well as to promote the dilution and excretion of toxins. A low serum protein particularly affecting the albumin fraction may exist because of a deficiency in hepatic function and inadequacies in diet; transfusions of blood or plasma¹⁶ may restore the protein level.

Poor renal function is equivalent to poor surgical risk.¹⁷ The part played by the kidney in the hepato-

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1. Quick, A. J. Clinical Value of the Test for Hippuric Acid in Cases of Disease of the Liver, *Arch. Int. Med.* **57**: 544-556 (March) 1936.

2. Kerr, W. J.; Delprat, G. D.; Epstein, N. N., and Dunietz, Max. The Rose Bengal Test for Liver Function: Studies on the Rate of Elimination from the Circulation in Man, *J. A. M. A.* **85**: 942-946 (Sept 26) 1925.

3. Bassett, A. M.; Althausen, T. L., and Coltrin, G. New Intravenous Galactose Clearance Test for Differentiation of Obstructive from Parenchymatous Jaundice, *Proc. Soc. Exper. Biol. & Med.* **45**: 405-407 (Oct.) 1940.

4. Ravdin, I. S. The Protection of the Liver from Injury, *Surgery* **S**: 204-211 (Aug.) 1940.

5. Althausen, T. L. Dextro-*D* Therapy in Diseases of the Liver, *J. A. M. A.* **100**: 1163-1167 (April 15) 1933.

6. Heymann, W. Importance of the Liver for the Antirachitic Efficiency of Vitamin D, *Proc. Soc. Exper. Biol. & Med.* **36**: 812-814, 1937.

7. Holman, E. F. Vitamin and Protein Factors in Preoperative and Postoperative Care of the Surgical Patient, *Surg., Gynec. & Obst.* **70**: 261-269 (Feb 13) 1940.

8. Frazier, W. D., and Ravdin, I. S. The Use of Vitamin B₁ in the Preoperative Preparation of the Hyperthyroid Patient, *Surgery* **4**: 680-686 (Nov.) 1938.

9. Ivy, A. C., and Berman, A. L. Rationale of Bile Salt Therapy in Biliary Tract Disease, *Minnesota Med.* **22**: 815-820 (Dec.) 1939. Berman, A. L., Snapp, E.; Ivy, A. C.; Atkinson, A. J., and Hough, V. S. The Effect of Various Bile Acids on the Volume and Certain Constituents of Bile, *Am. J. Digest. Dis.* **7**: 333-346 (Aug.) 1940.

10. Ravdin, I. S.; Johnston, C. G.; Riegel, Cecilia, and Wright, S. L.: A Study of Human Liver Bile After Release of Common Duct Obstruction, *J. Clin. Investigation* **12**: 659-672 (July) 1933. Greene, C. H.; Hotz, Richard, Carter, R. F., and Twiss, J. R. The Postoperative Concentration of Bile Salts in the Human Bile, *Am. J. Surg.* **49**: 264-280 (Aug.) 1940.

11. Phibbs, B. P.; Wigodsky, H., and Ivy, A. C. The Effect of Oxidized Bile Salts on Gallbladder Bile, *Proc. Soc. Exper. Biol. & Med.* **45**: 313-314, 1940. Best, R. R. Physiological Biliary Flush in the Management of Biliary Tract Disease, *Southwest Med.* **23**: 396-398 (Dec.) 1939.

12. Horrall, O. H. Bile: Its Toxicity and Relation to Disease, Chicago, University of Chicago Press, 1938.

13. Quick, A. J. Prothrombin in Hemophilia and in Obstructive Jaundice, *J. Biol. Chem.* **109**: lxxv-lxxv (May) 1935. Smith, H. P.; Ziffren, S. E.; Owen, C. A., and Hoffman, G. R. Clinical and Experimental Studies on Vitamin K, *J. A. M. A.* **113**: 380-383 (July 29) 1939.

14. Almquist, H. J. Purification of the Antihemorrhagic Vitamin, *J. Biol. Chem.* **114**: 241-245 (May) 1936.

15. Aggeler, P. M.; Lucia, S. P., and Goldman, Leon. Effect of Synthetic Vitamin K Compounds on Prothrombin Concentration in Man, *Proc. Soc. Exper. Biol. & Med.* **43**: 689-694 (April) 1940.

16. Ravdin, I. S.; Stengel, Alfred, Jr., and Frushankin, Mitchell. Control of Hypoproteinemia in Surgical Patients, *J. A. M. A.* **114**: 107-112 (Jan. 13) 1940.

17. Elsom, K. A. Renal Function in Obstructive Jaundice, *Arch. Int. Med.* **60**: 1028-1033 (Dec.) 1937.

renal syndrome is important, so that functional tests should be carried out and urinary output watched closely before and especially after operation. Poor renal output is regarded as a serious prognostic sign and may suggest poor hepatic function.

Only under exceptional circumstances are jaundiced patients operated on during elevation or fluctuation of

TABLE 1—Mortality of Gallbladder Operations at University of California Hospital from 1930 to 1940

	Number	Deaths	Mortality Rate, Per Cent
Cholecystectomy, chronic disease	290	4	1.4
Cholecystectomy, acute disease	53	2	3.8
Common duct exploration with cholecystectomy or cholecystostomy	86	5	5.8
Cholecystostomy	6	0	0
All cases	435	11	2.5

the icteric index; if the jaundice is subsiding, operation should be delayed until the patient becomes free from jaundice, thereby lessening the risk of surgical treatment

Many different anesthetic agents have been advocated by various workers. Skilful administration of the agent selected and prevention of anoxia of the liver are important in maintaining adequate function. High concentrations of oxygen should be used, and hypotension and circulatory depression should be avoided.¹⁸ The use of oxygen postoperatively may be advisable.

Sedatives are used only in small doses so as not to depress further the patient with an injured liver. Morphine may cause further depression and provoke anoxia of an already damaged liver.

Postoperative cholangiograms should be made as a routine on all patients whose gallbladder or extrahepatic bile ducts have been drained. The tube in the common duct is not removed until after this procedure has been carried out in the search for an overlooked stone. The work of Best and Hickens,¹⁹ Walters, McGowan, Butsch and Knepper²⁰ and others has shown that the use of antispasmodic drugs such as amyl nitrite, glyceryl trinitrate and magnesium sulfate, the presence of some fats in the diet and the use of bile salts all have

TABLE 2—Acute Cholecystitis

	Number	Deaths	Mortality
Cholecystectomy*	53	4	7.5%
Cholecystostomy	6	0	0
Total ..	59	4	6.8%

* Two deaths of patients with common duct exploration

the effect of relaxing the sphincter of Oddi, which may control the symptoms of biliary colic after operation or even assist in the passage of an overlooked ductal calculus. Morphine or its derivatives increase the resistance of this mechanism.

¹⁸ Rydin, I. S., Var, H. M., Goldschmidt, Samuel, and Klingensmith, L. E. Anesthesia and Liver Damage. II The Effect of Anesthesia on the Blood Sugar, the Liver Glycogen and Liver Fat. *J. Pharmacol. & Exper. Therap.* 64:111-129 (Sept.) 1938.

¹⁹ Best, R. R., and Hickens, N. F. Biliary Dyscnnergia. Physiological Obstruction of the Common Bile Duct, *Surg. Gynec. & Obst.* 61:721-734 (Dec.) 1935.

²⁰ Walters, Waltman, McGowan, J. M., Butsch, W. L., and Knepper, P. A. The Pathologic Physiology of the Common Bile Duct. *I. A. M. A.* 109:1591-1596 (Nov. 13) 1937.

RESULTS OF SURGICAL PROCEDURES ON THE BILIARY TRACT AT THE UNIVERSITY OF CALIFORNIA HOSPITAL FROM 1930 TO 1940

A study of four hundred and thirty-five primary operations for cholecystic or ductal disease, exclusive of neoplasms and strictures, during the last ten years shows an operative mortality of 2.5 per cent (table 1). The mortality of simple cholecystectomy for acute cholecystitis can be seen to be two and one-half times that for chronic disease. In our hands, exploration of the extrahepatic bile ducts, in addition to surgery of the gallbladder, produced a mortality of 5.8 per cent as compared to 1.7 per cent for simple cholecystectomy for both chronic and acute disease. This seems plausible because those patients whose common ducts were explored had more extensive disease, were often jaundiced and had impaired hepatic function; in addition, it is logical to anticipate a higher mortality if the operation is more extensive.

The operative mortality of cholecystectomy for acute cholecystitis was 3.8 per cent, but the inclusion of two deaths of patients who, in addition, had exploration of the common duct brought the mortality up to 6.8 per cent (table 2). Throughout this period of ten years, delayed or late operation was the preferred method of

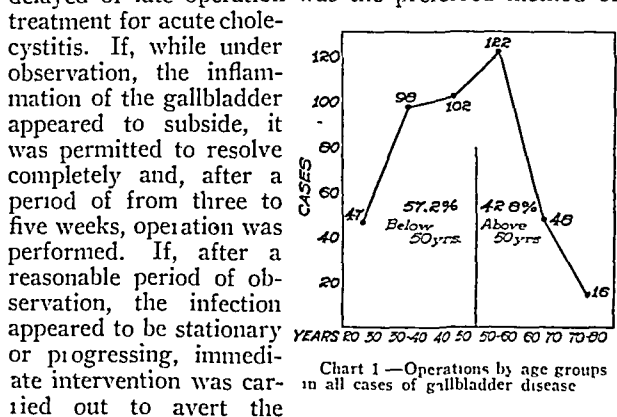


Chart 1—Operations by age groups in all cases of gallbladder disease

treatment for acute cholecystitis. If, while under observation, the inflammation of the gallbladder appeared to subside, it was permitted to resolve completely and, after a period of from three to five weeks, operation was performed. If, after a reasonable period of observation, the infection appeared to be stationary or progressing, immediate intervention was carried out to avert the danger of perforation.

In the aged patient, the signs may be minimal and the disease advanced. In elderly patients, who so frequently are poor risks, or those who have associated acute pancreatitis or pancreatic edema, cholecystostomy is preferred. This procedure was carried out in 6 such cases without a death. An attempt is always made to judge the basis of treatment for each patient by the merits of his particular case.

The causes of death of patients who had simple cholecystectomy differed from the causes found in those whose common bile ducts were explored. The patients who had no investigation of the ducts died of sepsis, bile peritonitis and cardiac or respiratory complications. In those who had ductal exploration, two deaths were caused by acute necrosis of the liver, hemorrhage and hepatorenal insufficiency; in two others intrahepatic jaundice was erroneously diagnosed before operation as being extrahepatic in origin. Consideration of these deaths makes evident the importance of proper evaluation of the functional state of the liver and proper diagnosis in patients with suspected disease of the bile ducts.

A study of patients by age groups (chart 1) shows that the greatest number underwent surgery during the sixth decade. Two hundred and forty-nine, or 57.2 per cent, were below the age of 50 years, while 186, or 42.8 per cent, were above that age, an important factor when considered in relation to the incidence of exploration of the common duct and mortality.

EXPLORATION OF THE COMMON DUCT

During the ten years, 19.8 per cent of all patients had their extrahepatic ducts explored, and formed stones were removed in 10.9 per cent of these (chart 2). The incidence of ductal exploration, by decades, varied from 10.6 to 14.3 per cent in patients under 50 years of age to as high as 43.7 per cent in those over 50 years of age

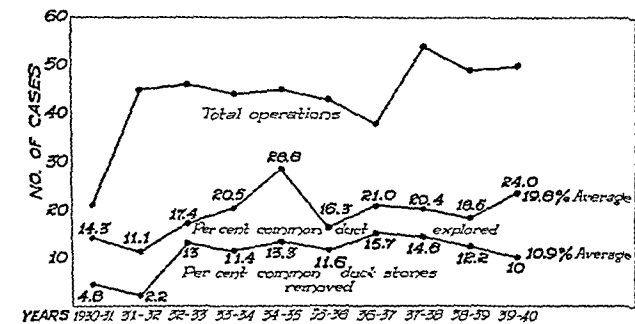


Chart 2.—Percentage of common duct exploration from 1930 to 1940 by years.

(chart 3). This suggests that surgical treatment in patients under 50 years of age will prevent ductal complications and also avoid the higher mortality resulting from such complications. It also implies that when the majority of patients treated are under 50 years of age the incidence of exploration of the common duct will be lower than when the ages are higher. At this hospital the incidence of exploration of the common duct is lower than that reported by many authors,²¹ some of whom report exploration in from 35 to 50 per cent of patients with cholelithiasis but the removal of stones in only about 50 per cent of the ducts explored. In most of our cases of disease of the gallbladder the common bile duct, which is always exposed, was found to be normal in size and, unless such a patient had recently experienced colic, was jaundiced at the time of operation or had palpable stones in the common duct, exploration was not done. Since the enthusiasm for exploration of these ducts during the past five years, we have encountered many patients with stricture or biliary fistula who, at the original operation, had exploration of ducts normal in size. Technical difficulties and the dangers of resultant stricture from exploring a duct of normal size are much greater than those encountered in opening a dilated common bile duct.

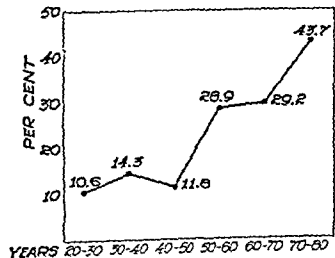


Chart 3.—Percentage of common duct exploration by age groups; common duct explored in 19.8 per cent.

tion of the common duct (this was before postoperative cholangiography was used routinely). Except for patients who had cholecystostomy for acute cholecystitis, only 1 patient whose common duct was not explored at

the first operation was operated on a second time; a large amount of "liver sand" was removed. This patient originally had a cholecystoduodenal fistula which was closed at the primary operation when the gallbladder was removed. This suggests that symptoms after cholecystectomy are more likely to develop in patients who have had ductal exploration than in those who have not. Of patients whose common bile ducts were explored, follow-up showed between 74 and 82 per cent to be cured or improved. These patients with secondary negative ductal exploration for postoperative colic may have had chronic or acute pancreatitis, spasm of the sphincter of Oddi or duodenitis.

FOLLOW-UP

Of patients who had cholecystectomy for chronic cholecystitis with cholelithiasis, 93.3 per cent were reported to be improved or cured, while only 61.1 per cent of those with chronic noncalculous cholecystitis²² could be placed in this category. The residual complaints of pain, gas and indigestion were more frequent in the patients who had no stones than in those with cholelithiasis (table 3).

The causes of poor end results in our cases were error in diagnosis, chronic cholecystitis without stones, a grossly normal gallbladder, biliary dyskinesia, associated long-standing hepatic or pancreatic disease, or the removal of a functionless painless gallbladder even though it contained calculi.

Some of our patients in whom a grossly normal stoneless gallbladder was found at operation or who

TABLE 3.—Follow-up Results of Cholecystectomy

	Residual Complaints		
	Pain	Gas	Indigestion
Chronic cholecystitis with stones.....	5.6	25.2	16.3
Stoneless gallbladder.....	11.1	33.3	27.7

probably had dyskinesia and still had symptoms after operation noted that these symptoms were relieved temporarily, only to recur a few weeks or months after operation.² Such pains have been attributed to various causes. The sphincter of Oddi may lose its tone post-operatively and regain it after a few weeks or months at about the time that dilatation of the ducts takes place.²³ Transient increased resistance of the choledochoduodenal mechanism in the absence of the pressure regulating function of the gallbladder may cause pain by distention of the ducts.²⁴ This is exemplified by the earlier onset of jaundice in animals that had their common ducts ligated with excision of the gallbladder than in those in which the organ was left in place.²¹ Intermittent obstruction of the common duct by a spastic sphincter without the cushioning effect of the gallbladder may cause distention of the bile ducts, icterus and dull pain or biliary colic. The dilatation

22. Doehring, Paul C.: Macroscopically Nonpathologic Gallbladder: A Clinicopathologic Study, Arch. Surg. 42: 665-680 (April) 1941. Cole, Warren H.: Noncalculous Cholecystitis, Surgery 3: 824-839 (June) 1938. Bergh, G. S.; Sandblom, Philip, and Ivy, A. C.: The Effects of Removal of the Functioning Gallbladder, Surg., Gynec. & Obst. 62: 811-814 (May) 1936. Doubilet, Henry, and Colp, Ralph: The Resistance of the Sphincter of Oddi in the Human, ibid. 64: 622-633 (March) 1937. Puestow, C. B.: Changes in Intracholedochal Pressure Following Cholecystectomy, ibid. 67: 82-86 (July) 1938.

23. Graham, E. A., and Mackey, W. A.: A Consideration of the Stoneless Gallbladder, J. A. M. A. 103: 1497-1499 (Nov. 17) 1934. Layne, J. A., and Bergh, George S.: An Experimental Study of Pain in the Human Biliary Tract Induced by Spasm of the Sphincter of Oddi, Surg., Gynec. & Obst. 70: 18-24 (Jan.) 1940.

24. Ivy, A. C., and Goldman, Leon: Physiology of the Biliary Tract, J. A. M. A. 113: 2413-2417 (Dec. 30) 1939. Mann, F. C., and Hoffman, J. L.: The Relation of the Gallbladder to the Development of Jaundice Following Obstruction of the Common Bile Duct, J. Lab. & Clin. Med. 10: 540-543 (April) 1925.

21. Lahey, Frank H.: The Technic of Cholecystectomy and Choledochostomy, S. Clin. North America 19: 193. Allen, A. W.: The Surgical Management of Biliary Lesions, Surgery 8: 188-203 (Aug.) 1938. Surgical Treatment of Gallbladder Disease, Rev. gastroenterol. 1: 40-42 (Oct.) 1940. Cole, Warren H.: Present Day Concepts in Handling Gallbladder Disease, Nebraska M. J. 25: 429-434 (Dec.) 1940.

of the extrahepatic ducts does not entirely compensate for the loss of storage, concentrating and contracting functions of the gallbladder. The removal of the stoneless gallbladder therefore may not only be without benefit but may be harmful.

SUMMARY

1. Newer physiologic concepts have permitted a lower mortality in surgery of the biliary tract by providing more rational care both before and after operation.

2. In our cases during the last ten years the mortality of exploration of the common duct, in addition to operation on the gallbladder, is over three times that of cholecystectomy alone.

3. Exploration of the common bile duct was performed in 20 per cent of all our operations, but stones were removed in only 11 per cent. The incidence of the indications for exploration of the common bile duct will partially depend on age groups. Stricture or fistula of the common bile duct has become more common during the past five years.

4. Symptoms after cholecystectomy, requiring secondary operation, were more frequent in those who had ductal exploration than in those who did not.

5. The morbidity and mortality of ductal disease are minimal before the sixth decade, offering evidence of the wisdom of earlier operation.

6. Follow-up of our patients operated on over a period of ten years showed 93 per cent cured or improved among those who had chronic cholecystitis with stones, while in those without stones only 60 per cent reported cure or improvement.

ABSTRACT OF DISCUSSION

DR. WARREN H. COLE, Chicago: The authors reported a higher incidence of cure in patients on whom they had done cholecystectomy when stones were present than when stones were not present. The figure is about 93 versus 60 per cent. The inferior results in the patients without stones is explained largely on the basis of a large amount of error in diagnosis. When stones are present there is an obvious and mechanical explanation for symptoms. It is beginning to be realized that many of these gallbladders in which the condition is classified as chronic cholecystitis have inflammation which perhaps is primarily chemical. Later on this chronic fibrotic wall may become infected. There is not total agreement on this point, but I myself am convinced that the chemical inflammation exerts a very important role in the lesion, not only in many acute cases, but in many chronic cases as well. The authors touched on the question of the difference in mortality rate in cholecystectomy for acute cholecystitis versus cholecystectomy for chronic cholecystitis. In their series the mortality rate was much higher in the acute cases. Many surgeons report mortality figures for acute disease that are only slightly higher than in their chronic cases. The explanation of the comparatively low figures for acute cholecystectomy probably lies in the fact that the disease is caused by chemical inflammation and not bacterial. I take the same attitude as the authors in the question of cholecystectomy for acute cholecystitis, namely that they do not operate in all cases of acute cholecystitis. I usually do not but in general adopt an attitude somewhat as follows: If the temperature fails to show a distinct downward trend in thirty-six hours, or if the pain tends to increase and the muscle spasm increases with a rising leukocytosis, an emergency operation should be done. If one utilizes a rule such as that, one will not have many perforated and gangrenous gallbladders; at any rate, I have not seen one in ten years. Relative to Dr. Goldman's remark that better results are obtained in common duct obstruction if operation is performed several days after the onset of jaundice, that is, when it is decreasing or at least not increasing, this is difficult to explain, although it is the experience all of us have. A possible explanation is that after obstruction exists for several days the common duct dilates sufficiently for bile to pass around the stone and again enter the intestine.

FRACTURES OF THE SPINE

A STUDY OF TWO HUNDRED CASES

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There is considerable difference of opinion regarding the treatment of fractures of the spine—especially cases showing complicating neurologic signs. In view of this we undertook the present analysis of 200 consecutive cases of fracture of the spine admitted to Bellevue Hospital during the years 1930-1934. This material is presented in order to help formulate a rational routine treatment of fractures of the spine. Among many contributions we refer especially to the work of Frazier,¹ Jefferson,² Grant,³ Head, Riddoch,⁴ Walsh, Taylor,⁵ Elsberg,⁶ Stookey,⁷ Naffziger,⁸ Coleman,⁹ Pollock,¹⁰ Scarff,¹¹ Crutchfield¹² and others who have often stressed the wisdom of conservatism in the management of injuries to the spine.

All our patients had definite evidence of a fracture of the spine as established by positive roentgen evidence, postmortem evidence or gross and severe deformity of the spine with associated neurologic signs.

The following observations are of interest:

1. Of our 200 unselected consecutive patients with fracture, 169 were men and 31 were women (table 1).

2. An analysis of the nature of the trauma showed that 117 fell from a height, 69 had a direct trauma (of which 31 were by automobiles), 2 were thrown and in 12 instances the cause was not determined (table 1).

3. There were 35 deaths, the commonest causes being shock, respiratory failure in cases of injury to the cervical spine, complicating bronchopneumonia or complicating head injury (table 2).

4. The distribution of cases as regards sites of fracture is of interest. There were 52 in the cervical region, 40 in the thoracic region, 104 in the lumbar region and only 4 in the sacrococcygeal spine. As

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The director of the Neurological Division, the director of the Pathologic Department and the directors of the four surgical divisions of Bellevue Hospital gave their permission to study this material, and Miss Sarah P. Shiras helped with the early collection of some of the material.

1. Frazier, C. H., and Allen, A. R.: *Surgery of the Spine and Spinal Cord*, New York, D. Appleton & Company, 1918, pp. 325-356.

2. Jefferson, Geoffrey, and others, in *Discussion on Spinal Injuries*, Proc. Roy. Soc. Med. (Sect. Orthop.) **21**: 21-44 (Feb.) 1928.

3. Grant, F. C.: *Injuries of the Spinal Cord*, in Christopher, F.: *Textbook of Surgery*, ed. 2, Philadelphia, W. B. Saunders Company, 1939, pp. 320-327.

4. Riddoch, G.: *The Reflex Functions of the Completely Divided Spinal Cord in Man, Compared with Those Associated with Less Severe Lesions*, Brain **40**: 264 (Nov.) 1917.

5. Taylor, A. S.: *Is Early Operation Indicated in Fractures of the Spine with Cord Symptoms?* New York M. J. **107**: 583-585 (March 30) 1918.

6. Elsberg, C. A.: *Injuries of the Spinal Cord and Nerve Roots*, in Brock, S.: *Injuries of Skull, Brain and Spinal Cord*, Baltimore, Williams & Wilkins Company, 1940, chap. 19, p. 495.

7. Stookey, B.: *The Management of Fracture Dislocations of the Vertebrae Associated with Spinal Cord Injuries*, Surg., Gynec. & Obst. **64**: 407-419 (Feb., no. 2A) 1937.

8. Naffziger, H. C.: *Neurologic Aspects of Spine Injuries*, J. Bone & Joint Surg. **20**: 444-448 (April) 1938.

9. Coleman, C. C.: *Treatment of Fracture Dislocations of the Spine Associated with Cord Injury*, J. A. M. A. **111**: 2163-2172 (Dec. 10) 1938.

10. Pollock, L. J.: *Trauma and Disease of the Nervous System*, in Brahm, L., and Kahn, S.: *Trauma and Disease*, Philadelphia, Lea & Febiger, 1937, chap. 10.

11. Scarff, John E.: *Pathology and Treatment of Spinal Injuries*, New York State J. Med. **37**: 461-477 (March 1) 1937.

12. Crutchfield, W. G.: *Fracture-Dislocations of Cervical Spine*, Am. J. Surg. **28**: 592-598 (Dec.) 1937; *Treatment of Injuries of the Cervical Spine*, J. Bone & Joint Surg. **20**: 696-704 (July) 1938.

would be expected, the higher the site of fracture, the higher the mortality and morbidity rate. Twenty-one fractures in the cervical, 13 in the thoracic, 1 in the lumbar and none in the sacrococcygeal region were fatal (table 3). Only 86 of the 200 cases presented neurologic signs.

TABLE 1.—Age and Sex Distribution of Patients with Fractures of the Spine: Nature of Trauma

Age Distribution of Patients Age by Decades	Number of Patients
10-19 . . .	12
20-29 . . .	36
30-39 . . .	53
40-49 . . .	47
50-59 . . .	26
60-69 . . .	12
70-79 . . .	3
80-89 . . .	1
Unknown	10
Total	200
Males	169
Females	31
Nature of Trauma	
Fall from a height	117
Direct trauma	
Struck (31 by automobiles)	69
Thrown . . .	2
Cause not determined	12

5. A curve of incidence of specific areas of injury to the spine is of interest because it shows clearly that the commonest sites are at the levels of the second cervical, the sixth cervical and the twelfth thoracic or first lumbar vertebra. The accompanying chart confirms a similar observation by Jefferson, who studied statistically 2,006 cases of fractures of the spine.

6. (a) Careful analysis of the 52 patients with fracture of the cervical spine showed that 73 per cent had evidence of injury to the spinal cord or root. Moreover, 75 per cent of the patients who had neurologic signs died. Five of these latter patients had priapism and all died. Priapism was found present only in patients with injury to the cervical cord, and evidently it was an ominous sign. Another interesting feature of the cases in this group was that 3 pathologic fractures occurred in the cervical region (table 4).

(b) Analysis of the 40 cases in which there was a fracture of the thoracic spine showed that in 58 per cent

TABLE 2.—Causes of Death

Cause of Death	No. of Cases
Shock	10
Respiratory failure	7
Bronchopneumonia	7
Alcoholism and bronchopneumonia	4
Head injury, alcoholism and bronchopneumonia	2
Lobar pneumonia	1
Peritonitis (fracture of pelvis)	1
Postlaminectomy meningitis	1
Pyelitis	1
Decubitus and pyelitis	1
Total	55

there was evidence of injury to the spinal cord or root. In this group 52 per cent of the patients with neurologic signs died (table 5).

(c) Of the 104 persons with fractures of the lumbar spine only 24 per cent showed evidence of injury to the spinal cord or root. Of these, only 4 per cent (i. e. 1 patient) with positive neurologic signs died; in addition this patient was addicted to alcohol and sustained an injury to the head (table 6).

(d) The 4 patients with a fracture of the sacral spine all recovered; none presented neurologic signs (table 6).

7. The different types of injury to the spine occurring at the various spinal levels is of interest. In the cervical region, fracture dislocation was by far the commonest injury. In the thoracic region fracture dislocation and compression fractures are common, whereas the compression fracture is by far the commonest injury of the lumbar spine. Fractures of the transverse processes are commonest in the lumbar region (table 7).

8. The results of laminectomy are recorded in table 8 and show that of 15 patients operated on 8 died, 5 showed no improvement and only 2 showed improvement. These, of course, represent results of severe injury. Lumbar spinal fusion operations for chronic cases with root pain were performed on 3 subjects, and this procedure was beneficial.

9. Twelve patients came to autopsy. Of these 6 had pulpification of the spinal cord, 3 had severe hematomyelia mostly involving the gray matter of the cord. For the remaining 3, the pathologic report of the spinal cord is not available, but 2 died of shock and 1 died of bronchopneumonia (tables 11 and 12).

10. Sixty-one subjects had disturbances of control of the sphincter of the bladder and of the rectum. Of these 23 died, 14 of whom had injuries of the cervical

TABLE 3.—Composite Statistics

	Total Cases	Fatal	Improved or Recovered	Unimproved
Cervical *	52	21	29	2
Thoracic	40	13	20	7
Lumbar	104	1	96	7
Sacrococcygeal	4	0	4	0
Totals	200	35	149	16

48 patients had cerebral concussion 24 cervical cases
22 patients were under influence of alcohol
86 patients had positive neurologic signs

* Eight of 12 at sixth cervical were fatal; 6 in which laminectomy was done were fatal

cord, and only 9 had injuries of the thoracic cord. Only 12 patients had infections of the bladder and only 25 had trophic ulcers.

11. An important neurophysiologic and clinical observation relates to the significance of spastic or flaccid paraplegia. Twenty-five subjects had spastic paraplegia. Of these, 19 improved or recovered and 3 died, whereas 40 had flaccid paraplegia of whom only 3 improved or recovered, 12 were unimproved and 25 died. These data clearly emphasized the ominous significance of flaccid paraplegia complicating fracture of the spine (table 10).

12. Lumbar puncture manometric tests were performed in only 25 cases (table 13). We want to emphasize that 11 patients with severe damage to the cord had no evidence of manometric block. Another 8 patients with no evidence of damage to the cord had no block. The remaining 6 patients had complete manometric block. Of these, 3 were unimproved and 3 improved.

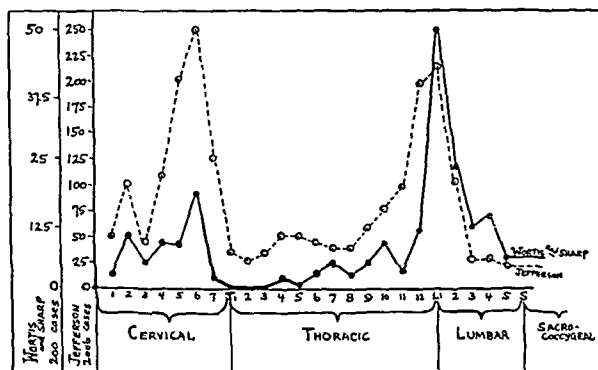
PATHOLOGIC AND PHYSIOLOGIC CONSIDERATIONS
Many investigators have emphasized the variety of pathologic changes in the spinal cord following injury to the spine. We agree with Charles Davison, who lists possible acute traumatic changes of the spinal cord as concussion, with or without small hemorrhages,

hematorachis (extradural, subdural and subarachnoid), hematomyelia (large or small) which may go on to softening and gliosis, herniation of the intervertebral disk, pulpification or/and injury to the nerve roots. In the subacute or chronic stage, one finds subarachnoid adhesions, herniation of the intervertebral disk, hypertrophy of the ligamentum flavum, gliosis or cavitation of the cord and bony changes hypertrophic, or atrophic (resulting in Kummell's disease).

One important fact which requires repeated emphasis is that the hemorrhages in the spinal cord are most apt to occur into the soft gray matter of the cord.

Careful survey of our case records and careful review of the clinical course of these patients substantiate the excellent observations of Riddoch.⁴ He described three clinical stages in the course of acute complete transverse spinal cord lesions.

The first stage of spinal shock or flaccidity immediately follows acute transection of the spinal cord. The subject "feels as though he were suddenly broken in half," and spinal shock follows. Muscles innervated by segments of the spinal cord below the level of the lesion are flaccid and completely paralyzed. The deep and superficial reflexes are abolished and muscle tonus is lost. All sensation is lost below the level of the



Curve of incidence of site of fractures of spine.

lesion. The skin is dry, the bladder and rectum are paralyzed and the penis is flaccid. The blood pressure drops temporarily owing to the impairment of tonic vasomotor reflexes which normally receive medullary innervation to sympathetic lumbar cord cells by way of the roots from the first thoracic to the second lumbar segment of the spinal cord. Transections of the cord below the level of the second lumbar segment produce little fall in blood pressure. Transverse lesions of the cervical spine often produce priapism; the exact pathophysiology of this response is not known. The paralyzed extremities are cyanotic and cold and tend to pressure ulceration, and there is an absence of secretion of sweat. This stage lasts three or four weeks.

In the second stage, reflex activity begins to reappear in the isolated segment of the cord. Functional activity first returns to smooth muscle. The sphincter of the bladder begins to recover before the detrusor muscle of the bladder. Retention of urine must be dealt with by catheterization, or better still by Munroe's tidal drainage. Next, tone returns to the paralyzed blood vessels. Proprioceptive reflexes concerned with postural tone reappear early, and there is paraplegia in flexion due to increase in the tonus of the flexor muscles. Phasic reflexes appear in the nature of flexor reflexes and the Babinski sign. In this stage one may see

the mass reflex action consisting of flexion of the lower extremities, contraction of the muscles of the abdomen, evacuation of the bladder and profuse sweating of the skin situated below the level of the lesion. This is evidence of the reflex action of the isolated segment of the spinal cord. One occasionally finds a coitus reflex

TABLE 4.—Fractures of Cervical Spine (Fifty-Two Patients)

	Patients
Had evidence of spinal cord or root injury, 73 per cent	
Had no neurologic signs and recovered.....	15
Died in shock soon after admission.....	3
Had radicular signs.....	8
Improved or recovered.....	6
Did not improve.....	1
Died of complications (postoperative meningitis following laminectomy).....	1
Had evidence of spinal cord injury.....	26
Had spastic paraplegia.....	11
(Of whom 3 died, 1 was unimproved when he left the hospital at own request and 7 were improved or recovered)	
Had flaccid paraplegia.....	15
(Of whom 14 died and 1 improved)	
* 75 per cent with fracture of cervical spine and neurologic signs died.....	21 of 26
Total with cervical spine fractures.....	32
Died.....	21
Improved or recovered.....	29
Unimproved.....	2
* Had pathologic fractures.....	3
Pott's disease at the third cervical.....	1
Cystic degeneration of body of second cervical with fracture dislocation.....	1
Metastatic cancer at third cervical.....	1
* Had priapism and all died.....	5
(Lesions at levels	
cals, sixth cervical	
Had multiple fractures.....	12

consisting of priapism and seminal emission elicited on the slightest stimulation of the glans penis. Other evidences of return of reflex activity are the reappearance of knee and ankle jerks, sweating of the skin, improvement in cutaneous circulation and the tendency of decubitus sores to heal.

In the third stage there is neurophysiologic evidence of gradual failure of reflex function of the isolated segment of the spinal cord. The reflexes diminish and then disappear, the reflexogenic cutaneous zone becomes smaller, the affected muscles atrophy, bed sores enlarge and bladder function is progressively impaired.

Clinically complete transverse lesions of the spinal cord are characterized by the following: The paralysis

TABLE 5.—Fractures of Thoracic Spine (Forty Patients)

	Patients
Had evidence of spinal cord or root injury, 68 per cent	
Had no neurologic signs and all recovered.....	15
Died in shock of cerebral complicating injury soon after admission.....	2
Had radicular signs and recovered.....	1
Had evidence of spinal cord injury.....	22
Had spastic paraplegia and all improved or recovered.....	4
Had flaccid paraplegia.....	18
Died.....	11
Unimproved.....	7
* 53 per cent with fractures of the thoracic spine and neurologic signs died.....	13 of 25
Total with thoracic spine fractures.....	49
Died.....	13
Improved or recovered.....	29
Unimproved.....	7
Had multiple fractures of dorsal or dorsolumbar spines.....	7
No recorded priapism in this group	
No pathologic fractures in this group	

is complete and symmetrical, voluntary movement does not return, the vasomotor and sphincter disturbances are significant, the deep reflexes are absent in the lower limbs, the sensory loss is total, spinal reflex such as the uniphasic flexion response is present and the Babinski toe sign, though absent early, appears in about three weeks. There are no associated irritative phenomena such as pains or hyperesthesias. In our experi-

ence, the very slow flexion of the toes on plantar stimulation (Gordon Holmes¹³ reflex) is an early and ominous sign of severe cord damage or transection.

In incomplete transection of the spinal cord, higher levels of the brain stem influence the motor picture by

TABLE 6.—Fractures of Lumbar Spine (One Hundred and Four Patients): Fracture of Sacral Spine (Four Patients)

Fractures of lumbar spine	Patients
Evidence of spinal cord or root injury, 24 per cent	
Had no neurologic signs and recovered.....	79
Died in shock soon after admission.....	1
Had radicular signs (all improved or recovered).....	7
Had evidence of spinal cord injury.....	17
Had spastic paraplegia.....	10
Improved or recovered.....	8
Remained unimproved.....	2
Had flaccid paraplegia.....	7
Improved or recovered.....	2
Remained unimproved.....	5
* 4 per cent with fractures of the lumbar spine and neurologic signs (shock case) died; patient was alcoholic and had cerebral concussion.....	1 of 25
Total with lumbar spine fractures.....	104
Died.....	1
Improved or recovered.....	96
Unimproved.....	7
33 had multiple fractures	
No pathologic fractures in this group	
Fracture of sacral spine	
None had neurologic signs and all recovered.....	4

way of vestibulospinal pathways to produce a picture of paraplegia in extension. This produces biphasic reflex movements (flexion and extension) and an extensor thrust. Occasionally one sees "steppage" movements in the nature of flexion of one limb and extension of the opposite limb. In summarizing the clinical picture of an incomplete transverse lesion of the spinal cord, we may say that it is characterized by the following: The paralysis is incomplete and asymmetrical; voluntary movement returns; vasomotor and sphincter disturbances are mild; deep reflexes in the lower limbs are present; sensory defects are only partial;

TABLE 7.—Types of Fracture

	Dis- loca- tion	Simple	Com- pres- sion	Fracture Disloca- tion	Lam- ina	Trans- verse Process	Spine	Total
Cervical.....	1	6	6	33	2	0	4	52
Thoracic.....	1	3	15	19	1	0	1	40
Lumbar.....	0	4	54	15	1	30	Involved	104
Sacrococcygeal	1	0	2	1	0	0	0	4
	sacral			coccygeal				
Totals.....	3	13	77	63	4	30	5	200

TABLE 8.—Laminectomy Results

	Number	Improved	Unimproved	Died
Cervical.....	6	..	..	6
Thoracic.....	4	1	1	2
Lumbar.....	5	1	4	..
Total.....	15	2	5	8

spinal automatisms show biphasic flexion and extension, an extensor Babinski toe sign and a predominance of extensor reflexes. Irritative phenomena in the nature of hyperesthesias and pains are present.

The evaluation of these clinical-neurophysiologic descriptions of complete and incomplete lesions of the spinal cord are most helpful to the physician or surgeon who deals with injuries to the spine.

TREATMENT RECOMMENDED

In view of the data presented, we would like to emphasize the wisdom of conservatism in dealing with fractures of the spine complicated by injury to the cord. A person who has flaccid paraplegia should never be operated on.

All persons with head injuries should have roentgenograms made of the spine. Fifty per cent of our patients with fracture of the cervical spine had associated cerebral concussion.

We believe that the following procedures are most effective:

1. There should be immediate first aid. People with an injury to the spine are best left alone until they can come under skilled management. The public, especially policemen, interns, hospital attendants and other persons who are apt to render first aid, must be taught that this group of injured patients are best moved on a flat board, preferably in positions of mild extension

TABLE 9.—Bladder and Rectal Sphincter Disturbance

	Number of Cases	Number of Deaths
Cervical.....	20	14
Thoracic.....	21	9
Lumbar.....	20	0
Sacrococcygeal.....	0	0
Bladder infections.....	12	
Trophic ulcers.....	25	

TABLE 10.—Spastic and Flaccid Paraplegias

	Spastic Paraplegia				Flaccid Paraplegia			
	Total	Improved or Recov- ered	Unim- proved	Died	Total	Improved or Recov- ered	Unim- proved	Died
Cervical.....	11	7	1	3	15	1	..	14
Thoracic.....	4	4	..	..	18	..	7	11
Lumbar.....	10	8	2	..	7	2	5	..
Totals.....	25	19	3	3	40	3	12	25
	*	12% died			*	62% died		

with minimum manipulation. For injuries to the cervical spine it is imperative that the neck be immobilized in extension.

2. Shock should be treated immediately, while the subject is on the stretcher, by appropriate methods. Morphine should not be given.

3. As soon as the period of systemic shock has passed, a roentgenogram should be taken of the spine while the patient is still on the stretcher. This avoids unnecessary manipulation with the related possibility of increasing damage to the spinal cord.

4. The patient should then be put to bed with the appropriate correction of the spinal deformity and a careful general and neurologic examination made and recorded in detail. These data, together with the history, will give the physician an accurate appraisal of the patient's status and will serve as a point of reference in watching the progress of the injury to the cord and thereby help to modify the treatment. The spinal deformity should be corrected and the spine then immobilized by an appropriate method.

5. The following are indications for operative surgical intervention, which should always be done extradurally:

(a) When a lamina of the spinal cord is fractured, causing cord compression, hyperextension with pressure

13. Holmes, Gordon: Spinal Injuries of Warfare, Brit. M. J. 2:769, 1915.

directed at the point of deformity is contraindicated. In these cases operative removal of the offending fractured lamina should be done, and it is important that the surgeon do his work extradurally.

clinical signs increase, decompressive laminectomy is indicated. This group is the only one in which spinal fluid manometric studies are of value. We do not believe that routine spinal taps in all cases of acute

TABLE 11.—Autopsy Findings

Location	Injury to Bone	Cord Injury	Other Findings	Cause and Time of Death
Third cervical	Fracture dislocation	Pulpification	Ruptured spleen; fracture of 6th and 7th ribs	Respiratory failure
Fourth cervical	Fracture dislocation	Pulpification	0	Respiratory failure
Seventh cervical	Spines	0	Fracture of ribs, sternum, clavicle, pelvis, mediastinal hemorrhage	Shock
Sixth cervical	Fracture dislocation	Hematomyelia	0	Died 7th day
Sixth cervical	Fracture dislocation	Hematomyelia	0	Died in 18 hours
Sixth cervical and seventh thoracic.....	Fracture dislocation with free mobility	Pulpification	Fracture of ribs	Shock few hours
Tenth thoracic	Compression fracture	Pulpification	Thrombosis of right middle cerebral artery, anemic infarction of right basal ganglions, punctate hemorrhage of right cerebrum	?
Ninth and tenth thoracic.....	Separation	0	Fracture of 4th to 10th ribs; bronchopneumonia; cerebral arteriosclerosis	Bronchopneumonia
Twelfth thoracic	Fracture dislocation	Pulpification	0	Died 14th day
Twelfth thoracic	Fracture dislocation	Swelling, softening, hemorrhage	0	12 hours
Twelfth thoracic and first and second lumbar.....	Compression fracture	?	0	Shock
First lumbar and sixth and seventh thoracic.....	Compression fracture; separation of sixth and seventh thoracic	Pulpification	0	Third day

TABLE 12.—Operative Findings

Type of Operation	Location	Findings	Results
1. Laminectomy	Second cervical	Fracture dislocation of second cervical; compression distortion of cord	Died 2d postoperative day
2. Laminectomy	Fourth and fifth cervical	Fracture dislocation of fourth cervical with crushing of cord	Died 24 hours after operation
3. Laminectomy	Sixth cervical	Fracture dislocation of sixth cervical; hematomyelia; post-operative meningitis	Died
4. Laminectomy	Third to sixth cervical	Fracture dislocation of fifth cervical; dura intact, no hemorrhage seen; compression of cord	Died 1st postoperative day
5. Laminectomy	Fifth to seventh cervical	Fracture dislocation of sixth cervical; no gross pathology seen	Died 3d postoperative day
6. Laminectomy	Fifth to seventh cervical	Fracture dislocation of sixth cervical; compression of cord	Died 12 hours after operation
7. Laminectomy	Ninth to eleventh thoracic	Dura not opened; no gross pathology.....	Unimproved
8. Laminectomy	Eighth to twelfth thoracic	Fracture eleventh thoracic; subdural hematoma; cord not compressed	Much improved; sensation and motor power returned
9. Laminectomy	Twelfth thoracic	Fracture dislocation of twelfth thoracic; compressed cord	Died 13d postoperative day; infected red sores and pyelitis
10. Laminectomy	Twelfth thoracic	Fracture dislocation of twelfth thoracic; cord swollen and compressed	Died in 12 hours
11. Laminectomy	Twelfth thoracic to second lumbar	Fracture dislocation with thinning of cord.....	Unimproved
12. Laminectomy	Twelfth thoracic to second lumbar	Fracture dislocation of first lumbar; compression of cord with subdural hematoma	Unimproved
13. Laminectomy	First lumbar	Compression fracture of first lumbar; no pathology seen	Improved
14. Laminectomy	First lumbar	Not described	Partial return of sensation and bladder function 2 years later
15. Laminectomy	First to third lumbar	Compression of cord; extradural hemorrhage; dura not opened	Unimproved
16. Spinal fusion	First lumbar	Compression fracture of first lumbar.....	Improved
17. Spinal fusion	Third lumbar to sacral	Old fracture of fourth lumbar.....	Improved
18. Spinal fusion	Third lumbar to sacral	Fracture of fifth lumbar.....	Much improved
19. Removal of coccyx	Coccyx	Removal of displaced and fractured coccyx.....	Recovered

(b) Patients showing after spine injury, incomplete cord lesion and definite evidence of bone fragments in the canal.

(c) Some cases with signs of incomplete cord lesion show evidence of progressive cord dysfunction despite reduction and immobilization. Spinal tap should be performed and if manometric block is present and the

fracture of the spine are necessary. Only those patients should have lumbar puncture manometric tests who, it is believed, can be helped by operation. If there is no bone in the canal and the system is open, there is obviously no need to operate. We do not agree that in every case a spinal fracture requires a lumbar puncture manometric test; the procedure has definite risk associ-

ated in the act of moving the patient. Careful roentgen studies are of much greater value.

(d) Lesions of the cauda equina should be treated like peripheral nerve lesions. Laminectomy is indicated when bony compression injures the nerve elements of the cauda.

(e) Cases of intractable root pain secondary to fracture of the spine or of a lamina will occasionally require the attention of the surgeon.

6. Other aids used in caring for these patients are:

(a) Air mattress and care of the skin to prevent bed sores.

(b) Care of the bladder. Early in flaccid states of spinal shock the bladder should be treated according to the method of Credé. Later in flaccid or spastic cases with troublesome urinary retention, tidal drainage is most effective.

(c) Care of the bowels: The patient should not be disturbed for the first forty-eight to seventy-two hours after injury. Subsequently, colonic irrigations should be used every second or third day.

TABLE 13.—*Spinal Manometric Tests*

25 tests were done on the 300 cases		Patients	
Severe cord damage and no manometric block		11	
Taps were bloody ..		6	
with flaccid paraplegia	4		
with spastic paraplegia	2		
Chemical evidence of severe cord dysfunction, negative spinal manometric tests and cerebrospinal fluid clear	5		
No evidence of cord damage; had no block		3	
Complete manometric block		6	
Flaccid paraplegia		3	
Spastic paraplegia		2	
Only root signs		1	
Died		1	
Unimproved		2	
Improved		3	
No evidence of manometric block		19	
Nevertheless, severe damage of the spinal cord		11	

(d) Care of the limbs: Place a cradle over the foot of the bed to relieve the feet of pressure of the blankets. Use foot rolls to bolster and dorsiflex the feet to avoid shortening of the tendon with resultant deformity. Later, posterior molded splints can prevent foot drop.

(e) Fractures of the cervical spine with paralysis of the diaphragm may require care in a respirator after the deformity of the neck has been corrected and the neck has been immobilized.

7. In a few instances there may be an indication for late operative intervention in the following conditions:

(a) Callous encroachment in the spinal canal giving slowly increasing neurologic signs.

(b) Callous encroachment on the spinal roots giving intractable pain not helped by injection of the roots. Such patients may require rhizotomy or chordotomy.

(c) Herniation of the intervertebral disk giving back pain, associated neurologic signs and roentgen or myelographic evidence of herniation of the disk.

(d) Hypertrophy of the ligamentum flavum with increasing pressure on the spinal cord.

(e) Post-traumatic adhesive arachnoiditis.

In our experience, it is well to remain optimistic of the recoverability of function following what even at first sight appears to be severe injury to the spinal

cord. The physician has less reason to be optimistic in cases of flaccid paraplegia and the presence of the Gordon Holmes slow flexion reflex. Paradoxically, the presence of a Babinski sign in the first three weeks after severe injury to the spinal cord is a good omen

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ABSTRACT OF DISCUSSION

DR. F. C. GRANT, Philadelphia: I agree with the conservative attitude taken by Drs. Wortis and Sharp in the treatment of spinal fracture complicated by injury to the cord itself. This is particularly true in cervical fracture dislocation with cord damage. Our series of such cases with total cord injury, 31 in all, were reviewed. Thirty patients were operated on and none recovered. It is my belief that no patient with vertebral injury complicated by cord injury should be operated on regardless of the level of the lesion and regardless of whether the injury to the cord is complete or partial unless repeated neurologic examinations reveal a progressive lesion. This may seem to be a radical point of view. In certain cases in which roentgen ray studies show a decided narrowing of the bony canal, laminectomy may be indicated for relief of pressure, particularly if lumbar puncture reveals a partial or complete block. But even in such cases hyperextension and traction will help a great deal and the difficulty of caring for the operative wound will be avoided. Traction on the skull, either by the Crutchfield tongs or, if the tongs are not available, bilateral trephination and the use of piano wire through the trephine holes, is very effective in reducing dislocations or fractures with or without narrowing of the canal. A patient will tolerate 20 to 25 pounds weight to produce traction by these methods, far more, of course than could be used with the old fashioned jury mast. Reduction is possible by this means plus hyperextension even in low thoracic or lumbar regions. I am not opposed to lumbar puncture. The information to be obtained from this source as to the relationship between the cord and the vertebral canal may be important. Certainly with a cord injury and no evidence of block, no surgical indication exists. If a block, partial or complete, is demonstrable, the necessity for laminectomy will be seriously considered by some surgeons. The roentgen ray studies are also important, although just how much movement in these cases is justifiable to obtain the films is often questionable. The question as to the cause for the priapism shown in cervical cord injuries interested me. In chordotomy cases in which the pain level lies below the level of the fourth thoracic, pressure on the testicle is always painful although the skin of the scrotum and adjoining pelvic areas may be entirely analgesic. However, in a few cases of high cervical chordotomy, or in working with spinal anesthesia, the pain on testicular pressure seems to be abolished when the sensory level reaches to or above the first thoracic. The sympathetic afferent fibers enter the spinal cord below this level. Hence the pain on pressure over the testicles seems to be sympathetic in origin.

DR. LEWIS J. POLLOCK, Chicago: The contribution of Dr. Wortis and Dr. Sharp is especially timely now when we are instituting measures designed for national defense. When one recalls that until World War I the concept of Bastian was accepted that the distal segment of a severed cord is without function, the value of careful observations of spinal cord injury in civil practice is emphasized. Comparison of the injuries that I and others saw in the World War with these civil practice cases has interested me. When injuries were produced by missiles, not only the spine was injured but many other tissues as well and the mortality soon after the injury was very high; therefore the statistics relating to those cases which were seen chiefly in the equivalent of base hospitals differ widely from those which are reported now. Since grave injuries to the neck were frequently and immediately fatal, a large number of the cases reported dealt chiefly with injuries to the thoracic and to the lumbosacral spine. The mortality reported by Dr. Wortis and Dr. Sharp in their series was 17.5 per cent. Excluding those cases in which death occurred before evacuation to hospitals in zones of supply, Barré reported on 350 or more cases with only 85 survivals. The frequency in the war of spinal

cord and root injuries was about 1:10 as compared to peripheral nerve injuries. Some of the things that were noted in the war in relation to the localization of lesions have not been reported in civil injuries. For example, it was of interest to note that high cervical cord injuries were accompanied by hyperthermia, and low cervical cord injuries were often accompanied by hypothermia, slow pulse and low blood pressure. I am in agreement with the conservatism which has been recommended for the surgical treatment of these conditions. I think, however, as Dr. Grant has stated, that there may be some instances in which it may be of service. Manometric studies will probably determine those in which it is. Certainly unless one has definite evidence of either the impingement on the spinal cord by fragments or missiles or a spinal fluid block, there is nothing to operate on. Cauda equina lesions respond much as do peripheral nerves. The lesions recover spontaneously, leaving only small residues and, therefore, the indications for operation there are even less than they are in operation on the spinal cord. I have seen an instance in which a block was demonstrated and it was decided to wait a few days or a week and repeat the examination, and at the end of that time it was found that the block had disappeared and then at the expiration of ten days electric examination of the muscles showed that there was no reaction of degeneration; therefore, wisdom was exercised in not operating in these cases.

DR. EMIL SELETZ, Los Angeles: I have observed some 350 of these cases of fractured spine with involvement of the spinal cord. All the patients, most of whom were seen at the Los Angeles County Hospital, had neurologic signs, because those that did not were not admitted to the neurosurgical service. We have all seen spinal cord injuries two to ten years old, and many of these patients still complain of acute pain in the back, muscle spasm, and have a varying amount of spinal cord damage with neurologic findings. In those patients that could not be relieved by medical means and in whom when surgery was performed it was noted that movement of the fractured elements was still present, there had not taken place a solid bony fusion. The thought occurred that it was probably this movement that eventually gave rise to the hypertrophy of the ligamentum flavum, and possibly also that this movement helped to cause a protrusion of an injured intervertebral cartilage. It seemed logical, therefore, in these cases to fuse the spine before closing. The procedure can be made short by using the spinous processes removed at laminectomy instead of a tibial graft. When the pain in these cases was acute we performed a rhizotomy, cutting only the roots that seemed to be involved in the injury. After the wound healed we applied a light body cast, so that the patient was out of bed within a few weeks and thus eliminated long drawn out hospitalization. For the past two years I have done this in a select group of cases. Do not misunderstand that this is routine procedure at the General Hospital. It is my personal opinion. A patient with cord injury frequently gets an acute distention of the abdominal wall and of the intestine. I have found it most helpful to use the old fashioned belly binder early and in addition I have found that a Harris flush given in the proper way plus antispasmodic drugs has been of great help in relieving as well as preventing acute abdominal distention.

DR. S. BERNARD WORTIS, New York: We want to leave the impression that we do not hesitate to do a lumbar puncture manometric test if necessary. But we believe that this is not necessary as a routine procedure in every case of a fractured spine. All these cases we reported were at Bellevue Hospital and were seen by a neurologist. We would like to emphasize that the pathologic change of severe cord injury consists largely of hemorrhage into the gray matter of the cord, which the surgeon cannot help. We also would like to emphasize that the extradural operation is to be recommended when needed. As regards Dr. Seletz's discussion, in our series of two hundred spine fractures it was found necessary to do a spinal fusion in only three in the chronic stage. These all presented progressive neurologic signs as a chronic complication of the acute spine injury. We do not approve of nor would we recommend the routine spine fusion of all spine injuries.

FURTHER EXPERIENCES WITH THIOCYANATES

CLINICAL AND EXPERIMENTAL OBSERVATIONS

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AND

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Following our original report¹ on the blood level control of administration of thiocyanate in the treatment of hypertension, there have been five² publications and two reports³ which are in essential agreement with our original statements that blood pressure can be reduced and symptoms alleviated in more than 50 per cent of patients with hypertension provided that the criteria for adequate cyanate control are observed. The criteria of cyanate response used in our clinic are (1) general clinical improvement, (2) a substantial reduction in blood pressure (30 to 60 mm. systolic and 20 to 40 mm. diastolic) associated with (3) a blood cyanate concentration of from 8 to 12 mg. per hundred cubic centimeters.

The large number of questions that we have received from all parts of the country indicate that thiocyanate is being used extensively for the treatment of hypertension, and for this reason we feel that certain remarks regarding our clinical and experimental observations might be in order. We wish to review the uses and dangers of cyanate therapy experienced in our clinic and in private practice during the past ten years. During this time 246 patients have been on continuous, closely controlled thiocyanate therapy for intervals ranging from two to ten years.

INDICATIONS

We have employed thiocyanates in the treatment of hypertension under the following circumstances: first, when the other usual clinical measures have failed (social and psychiatric adjustments, sedation and prolonged rest, cardiovascular support, vasodilators and the like); second, when the patient's condition is either uncontrolled by the measures just mentioned or excessive sedation is necessary to control his symptoms so that he is physically, mentally and socially incompetent to carry on his daily routine, and, finally, after surgical treatment which has been unsuccessful. It is obvious, therefore, that close observation and clinical judgment must be exercised in the use and interpretation of such a program as that of cyanate therapy.

In 1929 a simple technic as described by Schreiber⁴ for determination of cyanate in the blood was modified so that adequate control of dosage could be obtained in patients receiving sodium or potassium salts of the thiocyanates without suffering significant toxic effects. Experience during the past ten years in our cardiorenal

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Read before the Section on Pharmacology and Therapeutics at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1. Barker, M. H.: Blood Cyanates in Treatment of Hypertension, *J. A. M. A.* 106:762 (March 7) 1936.

2. Massie, Edward; Ethridge, C. P., and O'Hare, J. P.: New England *J. Med.* 219:736 (Nov. 10) 1938. Robinson, R. W., and O'Hare, J. P.: *ibid.* 221:964 (Dec. 21) 1939. Covey, G. W.: Nebraska *M. J.* 25:363 (Oct.) 1940. Griffith, J. Q., Jr.; Lindauer, M. A.; Robert, Ella, and Rutherford, R. R.: *Am. Heart J.* 21:99 (Jan.) 1941. Blaney, L. F.; Geiger, A. J., and Ernst, R. G.: *Yale J. Biol. & Med.* 15:493 (March) 1941.

3. Kurtz, C.: *Am. J. M. Sc.*, to be published. Bunn, William: *Ann. Int. Med.*, to be published.

4. Schreiber, H.: *Biochem. Ztschr.* 162:241, 1925.

clinic at Northwestern University indicates that a blood cyanate concentration of from 8 to 12 mg. per hundred cubic centimeters gives the best sustained symptomatic relief and improvement in blood pressure without endangering the welfare of the patient. Likewise we are able to determine whether the dosage is adequate or whether the patient is taking his prescribed dosage. It would be fortunate if there were a similar accurate measure for determining the proper dosages of such drugs as digitalis or the arsenicals. Studies⁵ of the rate of excretion of the drug show that there may be an individual variation of 400 per cent, which emphasizes the importance of having a method for evaluating the dosage. The same patient shows variations of concentration depending on fluid balance, which varies with the season, with fluid intake and with physical activity.

DOSAGE

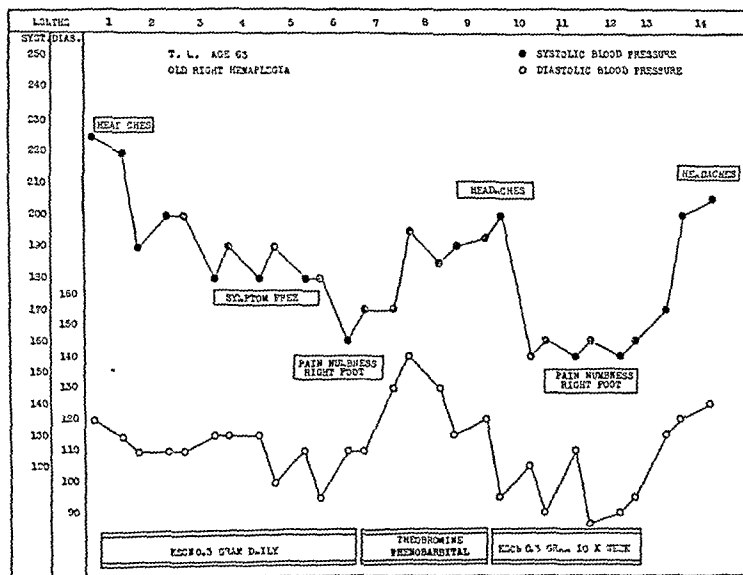
In general, we begin the treatment by giving the patient 0.3 Gm. (5 grains) of potassium thiocyanate daily in either liquid or tablet form. The blood cyanate

treatment. However, one must not focus one's attention so closely on reduction of the blood pressure that the patient and his disease complex as a whole are neglected.

The systolic blood pressure may drop during the first two to four weeks of therapy, while the diastolic pressure may not show a persistent reduction for from three to four months. An occasional patient will show no response of any kind for three or four months of continuous therapy. Excellent results may be obtained in all age groups and under many circumstances, but caution must be exercised in the patient with poor renal function because of his sharply reduced clearance of cyanate. Also in the group of patients with advanced arteriosclerosis a rapid fall in blood pressure may result in vascular occlusions. Once the symptoms, blood pressure, dosage and blood cyanate level have been satisfactorily correlated, the patient should return for check-ups at intervals varying from one to three months.

Our best clinical results have been obtained in patients with hypertension whose erythrocyte count is high, whose sedimentation rate is slow and whose blood pressure may be shown to be of the fluctuant type. This group includes the commonly discussed plethoric, emotional and menopausal varieties. Little or no benefit has been obtained in severe hypertension with fixed blood pressures in which blood counts are below 4.5 million with a progressing anemia and a rising sedimentation rate. Such cases may be classified as probable or actual malignant hypertension.

An occasional patient with advanced malignant hypertension exhibiting cardiac or renal failure may experience definite improvement for months or years, so that even this group might be given a thorough trial with cyanate therapy. In rare instances in which the malignant hypertension had produced cerebral symptoms of excitement, hallucinations, delirium and blindness, cyanate therapy has resulted in a remission which has lasted for weeks or months. We should like to emphasize here that not only in the malignant group but in any case of



Clinical course of a patient aged 63 with old right hemiplegia. The black dot indicates the systolic pressure and the circle the diastolic pressure.

determinations are then taken at weekly intervals for from four to six weeks. This dosage is decreased if the blood pressure drops sharply during the first one or two weeks of treatment or if the symptoms of fatigue and depression are great enough to interfere with the patient's sense of well-being. However, the dosage may be doubled during the second or third week if the blood concentration has not reached the level of 6 mg. per hundred cubic centimeters, if there has been no blood pressure change and if the patient has no toxic symptoms. Throughout the whole course of cyanate administration the dosage may be constantly varied—either increased or decreased or temporarily discontinued—depending on the patient's symptoms, blood pressure and blood level concentration. It should be emphasized that symptoms of fatigue, somnolence and mental retardation are often met during the first four to six weeks of administration. They are not, as a rule, indications for discontinuing therapy, although the dosage may be moderated. These symptoms usually disappear entirely after four to six weeks of continued

hypertension in which there are signs of cardiac decompensation an attempt should be made first to improve the cardiac function before cyanate therapy is begun. A gradual increasing blood pressure in a person with hypertension may be the first sign of cardiac failure, and as compensation takes place the blood pressure may fall to its basic hypertensive level. When this level is reached, cyanate therapy may be commenced.

Of 246 patients who had been previously uncontrolled by standard therapeutic measures for periods ranging from two months to two years, 47.5 per cent have shown persistent improvement in the symptoms, clinical status and blood pressure on thiocyanates for over a two to eleven year control period.

In addition to these figures, 19.5 per cent have shown significant reductions in blood pressure without any definite changes in their clinical status. Another 9 per cent have shown symptomatic improvement without alteration of blood pressure. These combined groups thus show that 76 per cent of our patients have received some benefit of one form or another from cyanate therapy.

5. Wald, M. H.; Lindberg, H. A., and Barker, M. H.: Toxic Manifestations of Thiocyanates, *J. A. M. A.* 112: 1120 (March 25) 1939.

TOXICOLOGY

No toxic deaths have occurred in our series during the past ten years. Only eighteen patients have shown persistent toxic manifestations or intolerance necessitating the discontinuance of the drug. As previously reported,¹ hemiplegia developed in a man aged 68 whose blood concentration had risen to 35 mg. per hundred cubic centimeters, and 1 patient suffered from delirium and hallucinations with a blood level of 45 mg. per hundred cubic centimeters which followed his drinking the drug from the bottle without measuring the prescribed teaspoon.

Two elderly patients had symptoms of angina when their blood pressure dropped below 150 mg. of mercury. Electrocardiograph tracings were normal during this period of time when anginoid distress was present. The angina disappeared as the blood pressure was allowed to rise to 165 mm. and above. One patient who had had a hemiplegia two years before cyanate therapy had symptoms and signs of his old hemiplegia when the blood pressure was allowed to fall to 150 mm. of mercury. These symptoms also disappeared when the cyanate was discontinued and the blood pressure returned to 180 mm.; this patient's clinical course is shown in the accompanying chart.

Four elderly patients with blood concentrations above 20 mg. per hundred cubic centimeters had extreme depression, word aphasia, slurring speech, unsteady gait and disorientation. All these symptoms disappeared when the drug was discontinued. Thus no patient in our series has shown severe intoxication unless the blood cyanate level has been 20 mg. per hundred cubic centimeters or above. It is not unusual, however, to see fatigue, secondary anemia and a dry scaling skin appear after many months of continuous ingestion of cyanate. If the red cell count drops below from 3.8 to 4 million, we have usually discontinued the drug until a count of from 4.25 to 4.5 million is again attained. We would rather see our hypertensive patients have a low normal or even a slightly subnormal red count than to maintain the usual high normal count.

The dermatitis, which may manifest itself in several ways (cracking at the corners of the eyes and mouth, scaling of the skin behind the ears or on the back of the neck, forearms and legs, back and chest or a papular bromide-like rash of the face, back of hands and back), will disappear after the drug has been stopped and may not reappear when thiocyanate is resumed. Severe forms of exfoliative dermatitis have not been experienced. An occasional large thyroid develops (11 cases) or a myxedematous facies is seen (9 cases) with basal metabolic rates in the neighborhood of minus 10. All these cases have shown recovery with 1 to 2 grains (0.065 to 0.13 Gm.) of thyroid daily within two weeks.

After many months or years of continuous therapy an occasional patient presents the clinical picture of asthenia, loss of weight, generalized muscular wasting and severe anemia which usually attend the downhill progress of widespread vascular disease even though the blood pressure during this period of time has been satisfactorily controlled.

None of the patients who were successfully managed with thiocyanate have been offered surgical treatment. No patient who has failed to show a response to thiocyanate therapy has shown any improvement after supradiaphragmatic and infradiaphragmatic splachnicectomy. As reported elsewhere, patients with a fairly

fluctuating type of blood pressure were submitted to surgery because very large doses of the salt were necessary to cause even modest blood pressure response.⁶ Splachnicectomy in itself did not cause a drop in blood pressure. However, when this cyanate was again started a satisfactory blood pressure response—particularly that of the diastolic pressure—was noted. These patients were then carried comfortably on the usual cyanate dosage with normal blood concentrations. We have observed similar responses to splachnicectomy followed by administration of thiocyanate in dogs in which hypertension was produced by the Goldblatt clamp. In respect to cyanate distribution in the body, it has been shown by Goldring and Chasis,⁷ Healy⁸ and others that the drug was equally distributed in the various tissues. We have confirmed these observations in man, dogs and rats.⁵

Carrying these experiments further, severe cyanate intoxication in dogs (40 to 65 mg. per hundred cubic centimeters blood concentration) shows no pathologic changes in any organ except damage to the liver and bone marrow, resembling benzene poisoning. The only additional changes shown in the dogs were reduced

Results of Thiocyanate Treatment of Hypertension: Two to Ten Year Control

Type of Response	Private Patients		Clinic Patients		Total	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
Symptomatic relief only.....	14	7.7	9	14.0	23	9.6
Blood pressure reduction only.....	36	19.9	12	18.4	48	19.5
Blood pressure reduction and symptomatic relief.....	94	51.9	23	35.4	117	47.5
No response.....	3	19.3	20	30.7	55	22.3
Response with toxicity.....	4		4		8	
No response with toxicity.....	9		1		10	
Worse on cyanate.....	5		2		7	
Total.....	181		65		246	

red cell counts, blood cholesterol and total serum protein findings, which could be explained on the pathologic change mentioned.⁹

CONCLUSION

Our impression concerning thiocyanate therapy in hypertension after having closely observed 246 patients for periods ranging from two to ten years may be summarized thus:

1. Controlled thiocyanate therapy has relieved symptoms and reduced blood pressure in 47.5 per cent of patients with hypertension.
2. Blood pressure reduction is effective only by adequate blood thiocyanate concentration of from 8 to 12 mg. per hundred cubic centimeters.
3. Improvement is to be expected in from two to four weeks. However, three months of persistent therapy may be required.
4. A maintenance dose must be individualized, depending on symptoms, blood pressure response and blood thiocyanate concentration (8 to 12 mg. per hundred cubic centimeters).

6. Davis, Loyal, and Barker, M. H.: *Ann. Surg.* **110**: 1016 (Dec) 1939.

7. Goldring, William, and Chasis, Herbert: *Thiocyanate Therapy in Hypertension: Observations on Its Toxic Effects*, *Arch. Int. Med.* **40**: 321 (Feb.) 1932.

8. Healy, J. C.: *New England J. Med.* **205**: 581 (Sept. 17) 1931.

9. Lindberg, H. A.; Wald, M. H., and Barker, M. H.: *Am. Heart J.* **21**: 605 (May) 1941.

5. The dosage varies in any one individual according to renal clearance, fluid balance, circulatory efficiency and seasonal variations.

6. Determination of the thiocyanate in the blood is the only safeguard to dosage control.

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ABSTRACT OF DISCUSSION

DR. JOHN R. WILLIAMS, Winston-Salem, N. C.: In the last few years a new concept of essential hypertension has developed. Hypertension is now classified into types on the basis of cause. The three general classifications are hypertension due to primary diseases of the kidney, that due to neurologic disease and that due to endocrine disorders. It is important to distinguish these types, because the group of patients who have hypertension based on or aggravated by nervous instability are helped in large measure by sedatives, rest and reassurance. Psychotherapy has been used with some success in treating them. It has been difficult to be sure which patients fall into this group.

THE PAROTID GLAND

ITS COMMON DISORDERS

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Because there is a wide range of printed material available on diseases of the salivary glands, it is a great temptation in discussing this problem to quote from numerous references and to pose the points of view of many workers who have made creditable contributions to the literature. I wish it were possible to pay tribute to the authors who have preceded me and to do justice to this subject by expressing their critical judgments, but space will not permit such a comprehensive review of this topic.

While the secretory glands that discharge their products into the oral cavity are recognized to be the parotid, submaxillary and sublingual glands, the glands of Blandin and Nuhn, the palatal glands, the Moore glands and numerous small mucous glands scattered over the buccal mucous membrane and floor of the mouth, I shall limit my discussion to but one structure, namely the parotid gland. A finished work on this subject is obviously impossible, but I shall endeavor to submit briefly pertinent observations on the parotid gland which may be helpful in formulating conclusions that will throw significant light on the pathologic conditions which involve the entire system of secretory glands.

When one takes into consideration the frequency with which the parotid gland becomes the seat of disease, its susceptibility to practically all the conditions that are common to other glands in this system and the principles which it can teach in the therapy of disorders of the secretory gland, the practicability of this point of view may not seem too far fetched.

The embryology and anatomy of the parotid gland recorded in standard anatomic textbooks call attention to the fact that the gland is lateral to the superficial layer of cervical fascia, the internal carotid artery, the facial vein and the facial nerve. A study of the embryologic development of the gland clearly reveals that these structures are invariably medial to the important ducts

of the gland from which branching and budding occur to produce the adult structure. Moreover, it must be borne in mind that the parotid gland has a number of extensions or prolongations which come into relation with neighboring tissues that often exert an important influence on the clinical behavior of pathologic processes within and about the gland. Students of this subject will do well to investigate the embryologic development of the parotid gland and grossly identify its prolongations before giving attention to the clinical aspects of diseases that are common to this structure.

INFECTIONS

From an etiologic standpoint, the occurrence of inflammatory processes within the parotid gland are recognized from three important sources. First, parotid abscesses resulting from foreign bodies in the duct particularly the salivary calculus; second, infections of the parotid gland occurring as a complication of abdominal operations, and third, inflammatory diseases arising as the result of direct extension from neighboring infections. The first causative factor, namely, the foreign body, of which the salivary calculus is the classic example, occurs less frequently in the parotid than in the submaxillary gland. When, however, its presence is felt to the extent of occluding Stensen's duct, the characteristic symptoms are sudden sharp pain when the salivary flow is stimulated, painful swelling of the gland and later the typical signs of suppuration with general reactive symptoms. Pus may be expressed from the duct, or palpation with the finger along its course may reveal the location of the offending calculus. Often the stone is felt with a probe introduced into the duct or is clearly visualized in a roentgenogram, particularly when augmented by the injection of a radioopaque substance.

Treatment calls for a simple internal operation which offers no important technical difficulties. A 2 per cent solution of procaine hydrochloride is injected about the papilla of the duct and along its course, the duct probed and then split open until the calculus can be grasped and removed. The duct mends and restores its patency in a phenomenal manner, and the risk of producing a salivary fistula is of no concern when this procedure is employed. When possible, the operation should be performed in the interval between acute exacerbations of the infection. It is well to treat the patient conservatively, if possible until the acute inflammation has subsided, before the surgical measures for removal of the stone are instituted.

I have never found it necessary to excise the entire parotid gland for multiple calculi and their associated inflammatory reactions, although the literature contains several references to recurring phlegmonous processes which called for total extirpation of the parotid gland even at the cost of destruction of the facial nerve. In several instances, however, I have made numerous incisions into the parotid gland for the removal of multiple calculi, and fortunately the few patients thus treated went on to satisfactory recoveries. One need only reflect the skin and subcutaneous tissue from the parotid gland, identify the stones by palpation and cut into the substance of the gland to expose them and thus effect their removal. The facial nerves are deeply situated in the tissues of the gland, so that it is possible to do considerable damage to the superficial parts without grave danger of injuring these structures. It must be remembered, however, that when one is dealing with multiple stones within a gland which has

been the seat of numerous inflammatory exacerbations the parenchyma is likely to have suffered serious injury and that the simple removal of the calculi may not be followed by a rehabilitation of the gland structure. In such cases the prognosis must be guarded. The possibility of a recurrence of the stones is ever present, and there is reason to doubt that the gland will ever make a complete recovery. Under such circumstances it may seem wise to attempt the more or less complete removal of the parotid gland, but if this operation is instituted every effort should be made to tease out the fibers of the facial nerve and protect as many of them as possible. It is amazing frequently to observe in removal of large noninfiltrating parotid tumors how extensively the gland may be excised with preservation of most of the important branches of the facial nerve.

Come now to the second causative factor in parotid inflammation to which reference has already been made, namely "in connection with injury or disease of the abdomen or pelvis." Sir William Osler¹ called attention to these factors and since his observations were recorded in the early editions of his treatise on internal medicine other authors have described the occurrence of parotid infections after major abdominal operations. It is doubtful whether there is any direct connection between an abdominal or pelvic operation and a parotid abscess; nevertheless, the sequential occurrence of the latter in isolated instances cannot be questioned. The explanation probably lies in the fact that the patient is dehydrated. I have never seen a parotid abscess develop in a patient whose fluid requirements were adequately fulfilled. Dehydration is constantly in evidence, and it is quite conceivable that the dry gland devoid of a protective flow or secretion may become infected by retrograde extension of mouth flora through the duct, particularly in persons with poor dental hygiene and septic oral cavities.

Perhaps too there is another factor which needs to be emphasized in this type of parotid abscess, namely the injury that may be done the parotid gland by the anesthetist who forcibly places his fingers under the angles of the mandible to hold the jaw forward during anesthesia. How often have patients been heard to complain bitterly of the soreness of their jaws after some prolonged surgical procedure in which the anesthetist caused firm pressure back of the ramus of the mandible. This practice may in my opinion injure the parotid gland and devitalize it to the extent that it becomes a fertile soil for the growth of infection.

And finally I come to the third important causative factor in the production of parotid abscess, namely the extension of infection from neighboring structures. In this connection it is essential to call attention to the anatomic relationships of the parotid gland and particularly its association with the pharyngomaxillary fossa. Through this space which is recognized to have important influences on the clinical behavior of suppurative processes in the neck, the inner prolongation of the parotid gland is open to infection on all sides. By this route it is exposed to the invasion of infection from the cervical vertebra and by inflammatory processes which originate in the retropharyngeal or peritonsillar regions. How frequently has the physician been startled by the appearance of a parotid swelling several hours or days after the onset of a peritonsillar

or retropharyngeal abscess and wondered what influences were at work to give rise to this association. The interposition of the pharyngomaxillary fossa between the pharynx and the inner prolongation of the parotid gland (the carotid lobe) is obviously responsible for this phenomenon, which occurs frequently enough to be regarded a clinical entity. By the same token, infections originating in the parotid gland, possibly secondary to a furunculosis of the external auditory canal or from any other source, may extend medially through the inner prolongation to the pharyngomaxillary fossa and thence to the structures of the pharynx. One must not lose sight of the important anatomic relationships of the inner prolongation of the parotid gland when dealing with suppurative processes within this structure.

TREATMENT

The most important factor in the palliative treatment of parotid abscess is hydration. It is absolutely imperative that the patient be given sufficient fluid to promote normal function of the excretory organs of the body. It is a matter of scientific fact that the average adult person requires approximately 3,500 cc. of fluid in twenty-four hours.² Obviously more is needed when a patient is vomiting or bleeding or when there are copious discharges from infected wounds in the body. If the patient is not receiving an adequate quantity of fluid each day by mouth it is necessary to administer it by the intravenous route. Other palliative measures of lesser value are hot external dressings, suberythral doses of roentgen rays, gentle probing of the duct, diathermy for the relief of pain and iodine in the form of large doses of compound solution of iodine.

When however there is definite evidence of suppuration, the abscess must be incised and drained. Too frequently this procedure is unnecessarily delayed in the hope that the palliative measures just enumerated will bring about a satisfactory recovery. Unfortunately suppurative processes of the parotid gland do not respond to simple therapeutic measures, and belated surgical procedures not only favor serious complications but frequently jeopardize the life of the patient. More and more emphasis must be placed on the early recognition of suppurative processes of the parotid gland and the institution of prompt surgical measures for adequate drainage.

All the palliative measures mentioned with the possible exception of hydration bear a minor relation to that conviction which governs my principles of therapy, for the parotid gland, namely the necessity of massive drainage when the gland is the seat of an abscess. I am unwilling to compromise with any other recommendation when there is evidence of pus in the gland. The incision for this purpose begins above at the level of the zygoma and extends downward in front of the external auditory canal, parallel with the ramus of the jaw and forward beneath the angle for a distance of 2 or 3 cm. along the inferior margin of the mandible. The skin and subcutaneous tissues are reflected forward, thus exposing the entire lateral surface of the gland and facilitating massive drainage of this structure. There need be no apprehension in making numerous incisions in the gland, once it has been exposed widely in this manner, because the fibers of the facial nerve are deeply situated and far removed from the risk of injury.

1. Osler, William: *The Principles and Practice of Medicine*, New York, D. Appleton-Century Company, Inc., 1892.

2. Coller, F. A., and Maddock, W. G. Water Requirements of Surgical Patients, *Ann Surg* 98:952 (Nov.) 1931

The rationale of this procedure becomes obvious to the person who has temporized with surgical measures of minor proportions in the treatment of this condition. A mere stab into one of the compartments of the gland rarely suffices to cure the patient. There is a great tendency for suppurative disease of the parotid gland to spread from one interstice to the other, and any attempt to follow the pockets of pus as they develop, and drain them by stab incisions, merely leads to numerous painful operations and an unnecessarily prolonged convalescence. Wide effective drainage in a one stage operation minimizes the sufferings of the patient and leads to results much more heartening than those obtained by more conservative surgical procedures. At the risk of pointing out the obvious, I might add that chemotherapy may be used locally in the wound and be administered for its general effect in accordance with the extent of the infection or its complications.

TUMORS

Any discussion of the subject tumors of the parotid gland calls for a consideration of that bizarre lesion which is termed the mixed salivary gland tumor. This is in accord with experience because it is found that the vast majority of neoplasms originating within the parotid gland fall into this classification. Since July 1, 1937, I have observed 72 patients with parotid gland tumors, 36 of which were diagnosed the mixed salivary gland type, 4 were sarcomas and 32 demonstrated the pathologic changes of carcinoma. There is strong evidence, however, in support of the view that those lesions which were classified as carcinomas represented the terminal malignant changes of a mixed salivary gland tumor. Likewise, the four sarcomas probably represented malignant alterations within the stroma of a similar lesion. In other words, it is highly probable that with the exception of a few adenocarcinomas which originate primarily within the glandular structure of the parotid gland, the greater number of carcinomas of this organ are at some time early in their development a relatively benign mixed gland tumor.

Aside from the pathologic indications of this association, the clinical history often supports this view. The patient frequently states that the lesion put in its appearance sometime during the third or fourth decade of life, grew slowly or not at all for many years and finally burst forth with a flourishing growth which led to the surgeon's recommendation to remove the parotid gland. When these lesions are found to be carcinomas of a far advanced character with no pathologic signs of having originated within a mixed salivary gland tumor, there is still supporting evidence in such a history that a neoplasm of this type gave rise to the malignant lesion. It goes without saying that a rapidly proliferating carcinoma occurring as such from the onset would not run a course of five to ten years or longer without destruction of extensive areas of tissue or the life of the patient.

The precise origin of mixed tumors is not clearly understood, although it is suspected that they are pathologic lesions derived from embryonal rests, aberrant structures or superfluous collections of cells. The mechanical hypothesis, which in a broad sense ascribes the derivation of these lesions to some disturbance or irregularity of the mechanics of embryonic development, is the one usually accepted. From my own observations and those of others the mass of evidence,

although speculative and devoid of scientific proof, leads to the opinion that mixed tumors develop from the proliferation of mesoblastic tissue which has been displaced during embryonic growth or which fails to attain adult characteristics.

CLINICAL MANIFESTATIONS

This problem is of pressing interest to the otolaryngologist because these lesions are frequently observed in regions to which he gives special attention. They are not confined alone to the parotid gland but occasionally arise within the tongue, hard palate, maxillary sinuses and the ethmoidal labyrinths, developing to proportions which destroy life. The mixed tumors are usually observed in young adults, grow slowly and cause very little inconvenience, so that surgical relief is seldom sought until an average period of seven years has passed since the new growth was first discovered. The tumors bear no etiologic relationship to acute parotitis, calculi in the gland or the chronic infective granulomas. In fact, there appear to be no extrinsic factors associated with these lesions, which perhaps lends further support to the view that they represent some disturbance in embryonic growth. One point that I wish to stress particularly is that those neoplasms which on palpation feel soft and boggy contain abundant parenchyma of an embryonic character and are usually found to be of a malignant nature. Conversely, those tumors which are hard consist of fibrillar connective tissue and bone and are the group among which the benign tumors are found.

Unhappily these lesions are vicious and cruel in their clinical behavior. They appear usually in young adults as a benign lesion which grows insidiously for several years but resolutely in the direction of a malignant change which eventually destroys the life of their host. Often years after what appeared to be a successful operation for the removal of a mixed tumor the lesion returns with alterations which depart further from their original benign state. With each recurrence the lesion accretes changes of a highly malignant character. One cannot emphasize too strongly Dr. Weller's dictum that the fate of the patient lies in the hands of the first surgeon. If he is successful in removing every vestige of the neoplasm, and this is frequently possible in the early encapsulated stages of the disease, there is little danger of a troublesome recurrence. If, however, portions of the neoplasm are allowed to remain, the growth which subsequently recurs is highly malignant and further surgical attempts are usually futile. It is this aspect of the clinical behavior of these lesions that should be kept constantly in mind to the end that the first surgeon will not fail in his responsibility to eradicate the lesion so completely that no tissue of potential danger remains in the field of operation.

PATHOLOGY

The microscopic structure of the mixed salivary gland tumor is varied and bizarre, which accounts for the term mixed tumor applied to these neoplasms. The lesion may arise as a myxochondroma composed of myxomatous material which stains like cartilage, groups of epithelial cells often assuming a glandular architecture, fibrillar connective tissue with mucin and occasionally lymphoid tissue and bone. As the tumor grows and particularly when it recurs after surgical intervention, frank carcinomatous alterations occur which reveal on successive examinations a transition from a com-

paratively benign chondromatous tumor to a rapidly proliferating epithelial neoplasm, highly malignant in character.

TREATMENT

The treatment is surgical. Before attacking the lesion I believe it is well to bear in mind that most of these tumors seem to originate within the inner prolongation of the parotid gland. In my series of cases this observation has been made so frequently that this portion of the gland is invariably exposed as the first step in our surgical approach. This phenomenon has occurred with such regularity that it seems almost certain that some embryologic explanation will be found to account for the site of predilection for these lesions in the parotid gland. The only reason that I can offer, admittedly based on somewhat desultory theory, is that the inner prolongation is the first part of the gland to be formed and that as the gland bud forces itself through young mesoblastic tissue cells, the latter are displaced or disturbed in such a manner that they do not subsequently develop adult characteristics. It appears to be definitely settled that the anlage of the parotid gland appears about the fourth week. The remainder of the gland, namely that portion immediately behind the temporomandibular articulation and in front of the external auditory canal termed the glenoid lobe and that portion at the posterior border of the mandibular ramus and on the inferior surface of the internal pterygoid muscle termed the pterygoid lobe, develops later, in all probability after the mesoblastic tissue through which the gland bud travels has had time to become more highly differentiated. I confess some trepidation in presenting this theory, but it seems to offer the only plausible explanation for the common location of mixed tumors in the carotid lobe.

Under general anesthesia (I prefer it to a local anesthetic in order that no response from the patient will interfere with a careful and radical dissection of the lesion) an incision 4 or 5 cm. long is made immediately beneath the angle of the jaw and is carried diagonally upward over the mastoid process. One will find it advantageous to carry the incision well up over the mastoid in order to free the auricle and facilitate its reflection forward in an effort to secure a wide exposure of the region of the carotid lobe. It will be found that the parotid gland lies immediately beneath the skin and subcutaneous tissue and that it is not covered by a dense layer of fascia so frequently described in anatomic textbooks. The tumor that is usually found to be encapsulated occupies a position inferior to the facial nerves and can be freely dissected from the deep recess occupied by the inner prolongation without danger of injuring these structures. The facial nerve emerges from the stylomastoid foramen immediately below the lobe of the ear and passes forward into the parotid gland where it divides into its various branches. This division, however, occurs above the region usually occupied by a mixed tumor, so that there need be little apprehension in making a radical attempt to remove every vestige of the new growth, even though it may extend inward under the angle of the jaw to depths which seem to offer undue hazards. Occasionally one will observe a rather large branch of the nerve passing parallel to Stensen's duct, but again this structure lies superiorly and can be retracted upward without danger of being injured.

The tumors are usually well circumscribed and are readily excised. The capsule is invariably thin, and

every effort should be made not to rupture it and spill its contents into the open wound. If such an accident does occur, it is well to retract the edges of the wound after the remainder of the lesion has been excised and scrub the field vigorously with a coarse brush while copious quantities of irrigating fluid are poured into the operative field. The wound is then closed without drainage.

PROGNOSIS

The point has been stressed that when these lesions are entirely removed the prognosis for a cure is singularly good. If, however, any remnants of the new growth are allowed to remain, giving rise to a recurrence, further surgical efforts are usually in vain. The lesion recurs with advancing malignant alterations, invades the elements of the facial nerve, lymphatics, the walls of the external carotid artery and the temporal vein and spreads within the gland to such an extent that most radical dissections are seldom of any avail. Metastases may occur late in the disease and are usually found within the lungs.

Occasionally Stensen's duct is opened when the lesions are extremely large, with the production of a parotid fistula. The latter usually responds most satisfactorily to a few exposures to roentgen rays.

Authorities agree that mixed tumors are not radio-sensitive and that irradiation is seldom a satisfactory method of treatment. While this probably is true, I am inclined to recommend roentgen therapy, particularly in those cases in which there is reason to suspect that not all of the lesion has been removed surgically. I have several patients under observation on whom roentgen therapy was employed after an operation which failed to remove the entire lesion who are alive and well without recurrence for periods exceeding five years. One must be guarded in condemning the roentgen rays in the treatment of these lesions because they appear to be radioresistant. Clinical experience alone impresses me with the opinion that roentgen therapy has a distinct place in the treatment of operative fields, particularly those which are regarded with suspicion after operations of doubtful effectiveness.

CONCLUSIONS

1. Prominent among the causative factors responsible for parotid inflammation are foreign bodies in Stensen's duct, particularly the calculus; injury or disease of the abdomen or pelvis; and extension of infection from neighboring tissues. Whatever the exciting cause of the abscess may be dehydration and injury are potent influences in its development and progress. The role of the pharyngomaxillary fossa as a receptor and distributor of infections of the neck must be recognized because of its intimate contact with the inner prolongation (carotid lobe) of the parotid gland.

2. One cannot avoid the hard way of treating parotid abscesses, namely by wide incision which secures massive drainage. It is the most charitable method in that it minimizes suffering and hastens the patient's recovery. A practice that must find a permanent place in the treatment of infections of the parotid glands is the institution of thorough hydration. There is no compromise for this therapeutic measure.

3. Mixed tumors of the parotid gland usually appear during young adult life and are probably the result of some disturbance in the mechanics of embryonic growth.

4. They are vicious in their clinical manifestation, in that they cause little inconvenience until they have

degenerated into a rapidly proliferating carcinoma. All early lesions probably contain malignant potencies.

5. The soft tumors are more prone to exhibit carcinomatous alterations than the hard firm ones.

6. Surgical intervention which accomplishes the removal of every vestige of the lesion is usually indicated. Hope of a cure rests with the surgeon who performs the first operation. If he can successfully eradicate every remnant of the tumor there is of course no danger or recurrence. When these lesions do recur, they usually present frank carcinomatous alterations, and further surgical efforts are ineffectual.

7. The weight of clinical evidence is in favor of roentgen therapy after the extirpation of these neoplasms, particularly when there is reason to suspect that a complete removal of the lesion has not been accomplished.

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ABSTRACT OF DISCUSSION

DR. WALTER B. HOOVER, Boston: Probing, palpation and simple roentgenologic examination will reveal in most instances the hard, radiopaque variety of calculus, but not all foreign bodies are of this quality. The diagnosis of disease of the parotid gland and its ducts can be greatly facilitated by the injection of radiopaque material into the ducts before the roentgenogram is made. Sialograms in cases of chronic infection are characteristic and show the ducts to be dilated, often tortuous and pocketed. In the cases of chronic infection without calculi, dilation of the opening of the duct and irrigations, with massage of the gland, may relieve the symptoms. If dilations fail to keep the duct freely open, a plastic procedure as advocated by Blair and Padgett is practical. In this procedure the opening and the buccal side of the duct are incised toward the gland and the lining of the duct sutured to the mucosa of the cheek. The chemotherapy of acute parotitis has been too limited for one to make dogmatic statements as to its effectiveness. In regard to surgical drainage, Dr. Furstenberg says "namely the necessity of massive drainage when the gland is the seat of an abscess. I am unwilling to compromise with any other recommendation when there is evidence of pus in the gland." I have seen a number of patients with acute parotitis in whom suppuration of the ducts occurred who recovered completely without other drainage. Each patient with acute suppurative parotitis is an individual problem and must be treated according to local conditions and general toxic reaction. When the patient is not unusually ill, hydration, roentgen radiation or radium packs, hot applications, oral hygiene and dilation of the duct may suffice without surgical drainage. When there is abscess formation in a localized area, with abatement in the general toxicity of the patient, local incision and drainage suffice. I was hoping Dr. Furstenberg would mention uveoparotitis, sarcoid or Heerfordt's disease, as this condition has received considerable space in recent literature. It is possible to confuse inflammatory masses in the parotid gland with tumors, and the possibility of their presence must be kept in mind. I should like to hear something about xerostomia and about excess secretions; also perhaps "mumps" should be mentioned. I agree with Dr. Furstenberg's statements concerning mixed tumors.

DR. GORDON B. NEW, Rochester, Minn.: In the treatment of the suppurative processes I feel as Dr. Furstenberg does that thorough drainage at one time is essential and that a cigaret rubber tube at least as big as the little finger should be used, as small drainage tubes are of little value. Through and through drainage frequently is used, and the tubes are sutured in position with silk so they cannot be displaced. When multiple through and through drains are employed the ends are held with safety pins so that they cannot come out. Thorough fixation of the drainage tubes in position is an essential part of the treatment. Drainage tubes should be left in place at least a week, in many cases two weeks and at times longer than that. They should not be removed until the condition subsides. Adenocarcinoma of the mixed tumor type is the most common

malignant tumor seen in the parotid region, and in a recent study of cases at the Mayo Clinic it was found that it forms 65.5 per cent of all adenocarcinoma of the head and neck. I feel that surgical excision is the treatment of choice for the primary untreated tumors. Recently I reviewed the case histories of and sent follow-up letters to a group of 449 patients who had treatment at the clinic for adenocarcinoma of the mixed tumor type in the parotid region. Two hundred and thirty-seven had primary tumors that had not been treated before the patients came to the clinic, and 212 had recurring tumors after previous removal elsewhere. Of the patients who had primary tumors when excision had been employed, 97 per cent were well five years later, and of the patients with recurring tumors 85 per cent were living five years later. The statistics on the ten, fifteen, twenty, twenty-five and thirty year survivals bring out the same fact; that is, that the patient with a tumor that has not been operated on previously has a much better chance of a long period without recurrence. Of the patients treated twenty years or more previously, 81 per cent of those who had primary tumors lived twenty years while only 33 per cent with recurring tumors lived twenty years. One is dealing with a low grade type of tumor that is encapsulated to begin with, so the prognosis in general is good. Dr. Furstenberg has suggested roentgen therapy for the recurring tumors. I feel that the use of radium emanation seeds inserted directly into the involved region at the time of operation is of value, and for recurring tumors that are seen later also I place radium emanation seeds directly into the tumor in regions where removal would probably injure the facial nerve.

DR. A. C. FURSTENBERG, Ann Arbor, Mich.: In connection with Dr. Hoover's discussion, may I add that when the wound is open, as in the case described by him, an adjunct of real value to the treatment is the local use of chemotherapy. One may use sulfathiazole. The powder is packed into the wound daily. The powder is rather soluble, however, so that it must be used frequently. If one is dealing with the streptococcus, sulfanilamide, a less soluble powder, is employed. I am glad that Dr. New brought up the discussion of parotid tumors, because it covers approximately one-half of my paper. I was unable to refer to this subject because of the limited time allotted me. Dr. New has emphasized that most of the tumors in the parotid gland are mixed salivary gland tumors. They are probably teratologic in origin, and represent some irregularity in the mechanics of embryonic development. They are most vicious in their clinical manifestations in that they grow slowly and insidiously, but resolutely toward malignancy. At first they are comparatively benign in the form of myxochondroma; later, however, there is a great tendency for them to undergo malignant alterations, to invade the lungs and to destroy the life of the patient. Another point that should be emphasized is that "The fate of the patient rests in the hands of the first surgeon." If he is successful in removing all the lesion, there will be no recurrence later. If, however, he does not excise all the lesion, there is a great tendency for the neoplasm to recur, and with each recurrence it departs further and further from its original benign state and becomes more malignant. Dr. New emphasized the point adequately that surgical intervention seems to be the method of choice in the treatment of these lesions.

Filters for Public Water Supplies.—Chlorination of water supplies did not begin in the United States until 1908, and the first federal standard for drinking water set by the Public Health Service did not appear until 1914. Filters began to be used on a small scale early in the nineteenth century at Paris, and the first large sand filter was used in London in 1829. It was after 1875 before the use of filters spread throughout Europe. In the United States the first filters for a municipal water supply were built at Poughkeepsie in 1870, yet only 1.5 per cent of the country's urban population was supplied with filtered water in 1890, and by 1914 the proportion had only reached 40 per cent. Large sections of the United States are still without filtered water, with consequent danger to public health.—Stern, Bernhard F.: *Society and Medical Progress*, New Jersey, Princeton University Press, 1941.

THERAPEUTIC NERVE BLOCK

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"Therapeutic nerve block" is but one of the many ramifications of regional analgesia. The history of the introduction and development of perineural injections of analgesic and neurolytic agents for therapy coincides with that of similar types of injections to control the pain associated with surgical procedures. The use of surgical analgesic nerve blocks has eclipsed by far similar procedures employed to cure or alleviate pain or symptoms resulting from disease or injury. Coming into being, as it did, less than fifty-seven years ago, regional analgesia found a large number of enthusiastic surgical pioneers to explore its possibilities, exploit its application and evaluate it in surgical practice. Nerve block was discovered at the very dawn of modern abdominal surgery when the leaders in medicine were focusing the attention of the world on the blessings of the scalpel and were giving their best efforts toward developing the possibilities that anesthesia and antisepsis had given to surgery. Therapeutic nerve blocking had no such generous reception. It has not received even a small fraction of the experimental or clinical investigation accorded the application of physiologic nerve section for painless surgical manipulations. Only within the last few years has real enthusiasm been shown for blocking peripheral nervous pathways with analgesic solutions to control other than surgical pain or treat disease. Even now the development and inevitable improvements of this practice suffer from lack of interest, and its evaluation still awaits the final test of liberal clinical application.

HISTORICAL DEVELOPMENT

The extraordinary pace of modern scientific accomplishment and the rapid strides of contemporary medicine favor the discoveries and innovations that by their nature are immediately applicable to a developing field of practice or by their dramatic contribution establish an entirely new role in medicine. It may, however, be too fast a pace or too exacting for every new idea with merit to gain a firm foothold and soon find its proper place and be progressively improved. That seems to be the fate of therapeutic nerve blocking despite the fact that, long before regional anesthesia was a reality, drugs were being injected in the neighborhood of nerves to relieve pain and restore tissues to normal.

Regional anesthesia came into being and flourished into prominence in a remarkably short time. Its birth came with the momentous demonstration by Koller¹ (Sept. 15, 1884) of the anesthesia which followed instillations of cocaine solutions in the eye. His first formal paper, read before the Vienna Medical Society, was hardly published (in October 1884) before W. S. Halsted and R. J. Hall (in November 1884) originated and utilized the principle of nerve blockings by intra-neural injection of cocaine solutions for surgical anal-

gesia.² It then spread and grew to its present status. It is, of course, true of regional analgesia as with any scientific innovation that a varying period of preparation with accumulation of numerous seemingly unrelated facts and experiences precedes its demonstration. Discoveries in medicine are rarely, if ever, made by accident or are a spontaneous creation of their announcer: it is only when knowledge has advanced to a point at which some one with vision and inspiration may collect the facts, recognize their significance and proceed to create an epochal discovery. Before Koller, who found the drug, and Halsted and Hall, who first applied the method, are a long list of efforts to utilize chemical, physiologic and physical means to eliminate pain at its source in the peripheral nerves. Braun³ in his early classic on the subject has a detailed account of many such investigations. Among them are the application of cold, compression of nerve areas, constrictions of the extremities and the local application of many drugs. The injection of drugs to relieve pain was a well developed practice, and local injections for anesthetic purposes were used many years before 1884. The hypodermic syringe, the tool destined to fill an all-important role in regional analgesia and therapeutic nerve block, was invented by Charles Gabriel Pravaz in 1851, and four years later Alexander Wood introduced the hypodermic syringe and needle for the relief of neuralgic pain with opium and morphine.⁴ Hypodermic medication and intravenous injections, which followed immediately, were employed with enthusiasm for a quarter of a century before the discovery of the analgesic properties of cocaine. It is altogether likely that inhalation anesthesia, being developed during the latter part of the nineteenth century and being in the early stage of uncertainty in 1885, did not retard the experimental and clinical efforts to apply hypodermic injections for surgical anesthesia. It is quite evident that surgery was not ready to give an all out effort to any anesthetic method until near the end of the past century, when the antagonism to Lister's antisepsis was overcome and the fear of infections banished. Halsted⁵ relates interestingly of his experiments in 1884-1885 with injecting the trunks of nerves supplying affected parts to permit surgery. Much of this work was done in a large tent erected near Bellevue Hospital in New York, since it was "impossible to carry out antiseptic precautions in the general amphitheater at Bellevue, where numerous anti-Lister surgeons dominated and predominated." Opposition to antisepsis was definitely overcome before the turn of the century. In practically all surgical centers dry heat and steam sterilization had replaced chemical antiseptics, and the stage was prepared properly thereby for the advent of cocaine as an anesthetic agent and the hypodermic syringe to bring its solutions in contact with unexposed nervous tissues. It is not unlikely that Halsted's wisdom and keen vision, which stimulated him immediately to apply Koller's discovery to general surgery and introduce the principles of regional anesthesia, would have had a greater influence in establishing the merits of nerve blocking had not his activities been interrupted by illness in 1885. It is now well known that he had become at this time an innocent victim to the drug cocaine.

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1. Koller, Carl: Historical Notes on the Beginning of Local Anesthesia, *J. A. M. A.* 90: 1742 (May 26) 1928.

2. MacCallum, W. G.: William Stewart Halsted, Surgeon, Baltimore, Johns Hopkins University Press, 1930.

3. Braun, Heinrich: Local Anesthesia, ed. 3, translated by P. Shields, New York, Lea & Febiger, 1914.

4. Matas, Rudolph: Local and Regional Anesthesia, Philadelphia M. J. 6: 820-843 (Nov.) 1900.

5. Halsted, W. S.: Surgical Papers, edited by Burkett, Baltimore, Johns Hopkins University Press, 1925.

which he so vigorously investigated.⁴ Two years from his life was required to conquer the addiction and regain the energy that carried him to his great and commanding achievements in surgery and medical education.

EPIDURAL AND SUBDURAL ANESTHESIA

The story of the early days of regional anesthesia must include the monumental contribution of J. Leonard Corning of New York. At the time Halsted was establishing the principles of nerve blocking, Corning,⁶ working on the problem from the neurologist's point of view, announced three notable discoveries. In November 1885 he described the first intrathecal injection of an anesthetic drug, the use of solutions placed epidurally and the important fact that the action of cocaine could be greatly prolonged by arresting the circulation in the anesthetized area with elastic constriction. The first of these contributions was lost for fifteen years and then resurrected and popularized by Bier (1899). The delay may be accounted for in part by the fact that it was six years after Corning's first "spinal" anesthesia that Quincke demonstrated the utility of lumbar puncture and showed that the introduction of a needle through the dura was feasible. The elastic tourniquet of Corning was replaced (1901) by Braun's discovery of the efficacy of "the chemical tourniquet," epinephrine.³ A little earlier in France, Cathelin introduced epidural injections of cocaine by way of the caudal canal; but the method and the later use of the lumbar and thoracic routes gained wide acceptance only after the careful work of Lawen of Leipzig (1910), which showed that injections into the sacral canal did not reach the subarachnoid space.⁴ Schleich (1888) gave great impetus to local and regional anesthesia by describing the value of isotonic saline solutions as the medium for preparing weak and less toxic dilutions of cocaine. With the solutions that he recommended, large amounts could be used to infiltrate wide areas of tissue and extend sensory anesthesia to include extensive operative fields. Except for the use of oil as an anesthetic agent diluent, little more was added to improve or replace the solutions used for injections until Schloesser (1903) suggested neurolytic injections of alcohol and Braun (1926) pioneered with its use for the control of the pain of angina pectoris.⁷

LABORATORY INVESTIGATIONS

The innovations to improve regional anesthesia and widen its scope in the early years were not confined to technical improvements, refinements of methods or the invention of more satisfactory tools. The contributions of scientific laboratories were not less important than those from clinics. The chemist Giesel isolated tropacocaine (1891), and Vinci with Merling (1898) produced the synthetic eucaine B as less toxic substitutes for the alkaloid cocaine. Stovaine (amylocaine hydrochloride) was introduced by Fournier (1903), and in the following year Einhorn discovered procaine (novocaine), the drug destined to reach and maintain, to the present day, the position of superiority as a regional analgesic agent.

The noteworthy list of contributions to this new medium for the control of pain must include many fundamental physiologic researches. Although the clinicians Koller, Halsted and Hall and other pioneers were

without the benefit of previous animal experimentation, later investigators were aided by such contributions as those of François Frank, who found (1892) that the action of cocaine was not limited to sensory fibers and that its effect was transitory without permanent nerve injury. He coined the term "nerve blocking" and also referred to the procedure as physiologic nerve section. Sicard (1899) and Masso (1890) added definite knowledge on the toxic properties of cocaine and warned that its use in the subarachnoid space was limited to injections in the lower thoracic or lumbar regions.⁴

This recital of historical incidents in the story of regional anesthesia has included but a few of the more important and earliest "firsts" in its development, and the limitations of this manuscript prohibit more. During the present century so numerous have been the important contributions from laboratories, clinics and individuals that merely to list them would require reams of paper. However, no discussion of the development of therapeutic nerve block would be complete without reference to the epochal studies on the autonomic nervous system from the laboratories of Claude Bernard, François Frank, Walter Cannon, Head, Forester, Langley, Dale, Loewi and Heymans, to mention but a few whose contributions are familiar and require no further comment. Add to these the investigations from surgical clinics as those of Jaboulay, Cushing, Jonnesco, Leriche, Matas, Kappis, Adson, Royle, Dogliotti, Labat and J. C. White similarly important, and the building blocks of the present day clinical application of physiologic nerve section to therapy is portrayed and the form of the edifice being erected may be dimly visualized.

APPLICATION OF THERAPEUTIC NERVE BLOCK

Although therapeutic nerve blocking is an outgrowth of regional analgesia, utilizing the same anatomic and physiologic principles, and therefore has an identical historical development, it can be said to have come into actual existence and gained recognition as a therapeutic measure during the last score of years. This belated arrival of a procedure with so much promise is not readily understandable. Its use in the important conquest of pain is entirely logical, since its primary role, the control of pain from chronically diseased and injured tissues, has a much broader field than surgical analgesia. Moreover, the chapter written by the medical profession on the elimination of intractable and non-surgical pain lacks brilliance. Therapy that includes narcotics with depression of bodily function and eventual addiction or the radical, often mutilating, surgical interventions as satisfactory remedies leave much to be desired. Any substitute that may promise to exempt bodily pain for even a relatively small number of sufferers has merit. Particularly is this true of therapeutic nerve block, since in competent hands it does not add to the patient's discomfort except temporarily in some cases during the manipulation and, if properly used, it is not often followed by untoward reactions. It has the further advantage of noninterference with other forms of treatment and requires minimal hospitalization. Moreover, therapeutic nerve block has recently gained a commanding argument for more general recognition, since it has been proved of value not for pain relief alone but to arrest the whole process of certain disturbed physiologic mechanisms and bring about a return to normal. The foregoing statements should not be construed as a recommendation for the indiscriminate or widespread use of therapeutic nerve blocking. It is a plea for a more generous appreciation

6. Corning, J. Leonard: *Local Anesthesia*, New York, D. Appleton & Co., 1886.

7. Schloesser, O.: *Heilung peripherer Reizzustände sensibler und motorischer Nerven*, Klin. monatsbl. f. Augenb. 41: 244, 1903.

of its advantages, more energetic efforts to explore its possibilities, to master and develop its technics and assign it to its proper place in therapy.

The number of nerve blocks that have been reported, often enthusiastically, in medical literature comprise an imposing list. It would be presumptuous to say that all these should assume a definite place in therapy. Neither have the experiences with the great majority recommended been extensive nor have they stood the test of uniformly successful results. However, many therapeutic nerve blocking procedures have been employed widely, and there have accumulated sufficient data to justify one to insist that they merit further trial and more widespread application. Some of those that have been employed in our clinic with optimistic results are included in this presentation without a detailed anatomic or technical discussion, or an attempt at accurate statistical evaluation.

SOLUTIONS FOR NERVE BLOCKING

It should be stated that the choice of the solution for injection constitutes, next to accurate diagnosis, the most important consideration in therapeutic nerve blocking. Procaine or similar analgesic drugs in saline solutions may be injected in the proper amounts and concentrations and repeated at frequent intervals without serious or disturbing sequelae. Drugs such as procaine in various oils may be used freely but with more caution since the complication of sloughing tissues, although uncommon, always is to be feared. Neurolytic injections of alcohol have been extolled often and not rarely condemned. Their use is justified when other less formidable therapeutic remedies have failed and injections of analgesic solutions are without permanent relief. An irritative neuritis will follow a small percentage of such injections. Disturbances of motor function and paralysis of sphincters may follow their (usually injudicious) use. It is to be remembered also that alcohol, if effective, must be placed in contact with nerve tissue and this requires an exacting technic. Finally, permanent cure is not always obtained, since regeneration of the injected nerve is inevitable. Reinjections may be performed, and, since the primary injection efficiently carried out usually eliminates pain for months or years and often permanently, the seriousness of the objection to alcohol is decreased. It may be argued confidentially that, compared with drug addiction so often following medical treatment and the many serious complications that accompany the imposing surgery frequently employed to eliminate pain, neurolytic injections of alcohol deserve less condemnation.

NERVE BLOCK OF HEAD AND NECK

Among the many therapeutic nerve blocks that have had wide application are those used to eliminate pains of the face and neck. Alcohol injections for the relief of trigeminal neuralgia has been the subject of many favorable reports which give results for thousands of treatments. If the diagnosis is without error and the solutions are properly placed, pain is always relieved. There are no contraindications to such treatment, and the only objection is that permanent relief is not always obtained. After several months or maybe years, pain usually returns. It is rarely, if ever, necessary to inject the gasserian ganglion, since excellent results are to be had by treating the separate peripheral nerve trunks.

Neuralgia of the greater occipital nerve has a pain distribution localized to the distribution of the posterior primary division of the second cervical nerve. Relief is

readily obtained by perineural injections of this nerve with procaine-alcohol, as it winds around the lateral mass of the second cervical vertebra.

Intractable pain from tuberculosis or other diseases of the larynx may be relieved by injections of the superior laryngeal branch of the vagus. Failures to effect relief must be explained by a faulty technic which does not place the solutions in the exact plane of tissues to reach the nerve.

Cervical plexus neuralgia is usually limited to a single segmental nerve. With accurate localization and careful differential diagnosis, therapeutic nerve block may be done with favorable prognosis. Brachial plexus neuralgia, often confused with cervical plexus neuralgia, may result from spasm of the scalenus anticus, osteoarthritis of the cervical or upper thoracic vertebra and numerous other conditions. These disturbances are not favorable for nerve blocking therapy unless it can be shown that an individual nerve segment is involved and surgical therapy is not advised. Painful shoulder is a common complaint and most often is due to periarthritic involvement or subdeltoid bursitis. Relief of pain may be obtained frequently by perineural injections of procaine or oil-anesthetic solutions in the lesser scapular notch to interrupt sensory impulses passing through the suprascapular nerve.⁸ Such treatment is definitely more valuable in acute conditions.

PARAVERTEBRAL SEGMENTAL NERVE BLOCKS

Blocking the thoracic and lumbar segmental nerves by the paravertebral route has several therapeutic indications. Intercostal neuralgia can be relieved by injecting the thoracic nerves. The same procedure is of definite value in the treatment of fractured ribs.⁹ This procedure is recommended as prophylaxis against respiratory complications as well as for relief of pain. Postoperative pain following operations on the chest wall and upper part of the abdomen may become less severe or are eliminated with paravertebral injections.

The lumbar and sacral segmental nerves may be judiciously blocked for many painful conditions. Meralgia paresthetica may be relieved by injecting the second and third lumbar nerves. Neurodocitis involving individual nerve segments is satisfactorily treated with injections close to the exit of the nerve at the intervertebral foramen.

Sciatica has been a target for therapeutic nerve block with varying success, and many technics are advocated. The procedure found most successful here combines procaine injections into the body of the piriformis muscle with paravertebral injections. Adequate relief is usually obtained after the injections have been repeated one or two times.

The sacral nerves are blocked for different painful conditions. Coccygodynia is an example for which the third, fourth and fifth sacral nerves that unite to form the coccygeal nerve are blocked.

INTRACTABLE PAIN FROM CARCINOMA

No group of patients with pain as a predominant symptom are more difficult to treat than those with carcinoma. In the large majority this pain is difficult to localize and relieve with nerve blocking. However, the results are gratifying to many patients. If the nerve supply to the growth is determined and is accessible, as

8. Wertheim, H. M., and Rovenstine, E. A.: Suprascapular Nerve Block, *Anesthesiology* 2: 541-545 (Sept.) 1941.

9. Rovenstine, E. A., and Byrd, Mary Lou: The Use of Regional Nerve Block During Treatment for Fractured Ribs, *Am. J. Surg.* 46: 303-308 (Nov.) 1939.

frequently obtains in malignant growths of the face and neck, nerve blocks are definitely indicated. The upper thoracic nerves can be blocked to relieve pain from carcinoma of the lung and pleura. When the new growth involves the abdominal viscera the pain pathways may not be interrupted easily. Blocking segmental nerves alone is not often sufficient, and autonomic fibers must also be paralyzed. If some type of physiologic nerve section can be devised to obviate recourse to progressively increasing and ineffectual morphine medication or the serious chordotomy, it should be done. Certainly an effort to apply such procedures should precede the initiation of addiction or radical neurosurgery. Epidural injections, and in some extreme cases subdural injections, may be indicated.

PARAVERTEBRAL INJECTIONS OF SYMPATHETIC NERVES

The most interesting and probably more promising of fruitful results from therapeutic nerve blocking are the technics for interrupting sympathetic pathways with analgesic or neurolytic solutions. This recent practice has already gained wide application and produced many favorable reports. A comparison of the value of the chemical destruction of sympathetic pathways and surgical section cannot be made accurately with present knowledge and experience, but there are indications that for many conditions the former are to be preferred.

Interruption of the sympathetic pathways at the stellate ganglion is used to cure hyperhidrosis of the upper extremity. It is useful to relieve sympathalgia of the face and causalgia. It has been employed successfully to treat post-traumatic spreading neuralgias, the pain of amputation stumps and vasomotor disturbances. The treatment of angina pectoris after medical remedies have failed to relieve pain is now conceded to include alcohol injections of the upper thoracic sympathetic ganglions.¹⁰ The same procedure has been effective in controlling or alleviating the distressing pain from an aneurysm of the arch or the descending aorta.

Interruption of lumbar sympathetic pathways is indicated for conditions in the lower extremities similar to those enumerated for the upper extremities. This therapeutic nerve block has been employed also to treat thrombophlebitis of the lower extremity. The results from these injections have been dramatic and largely successful. Not only is the pain relieved immediately but the whole process subsides promptly. This remedy represents so much of an improvement over previous therapeutic efforts that it should be used whenever the condition develops.

477 First Avenue.

ABSTRACT OF DISCUSSION

DR. CHARLES F. MCCUSKEY, Glendale, Calif.: The authors have adequately covered the subject of therapeutic nerve block from the standpoint of the early history and recent development. Their discussion of therapeutic application leaves no doubt that laboratory and clinical work must yet be done before we can properly select the cases that may be benefited by therapeutic procaine injections. Why some patients obtain permanent relief from pain after blocking of the nerves involved with a local anesthetic agent presents an intensely interesting problem. A procedure that I am using with sufficiently satisfactory results is blocking of the lumbar sympathetic for relief of thrombophlebitis. Two technics have been used for this procedure and the results have been equally satisfactory. Sixty-one patients have received this treatment. Of this number 27 were in the

general hospital service and the injections were made by different persons. Out of this group, 14 had excellent results. When they were on their feet again there was no edema. Seven were classed as satisfactory; for example, a small amount of ankle swelling was noticed after they had been on their feet for some time. Six were unimproved. Of 34 patients treated, the injections being done mostly by one or two men, 27 had excellent results, 4 satisfactory and 3 were unimproved. A boy in his early teens with a comminuted fracture of the left forearm presented so much swelling and circulatory disturbance that it was feared amputation might be necessary. Block of the stellate ganglion produced significant improvement in the appearance of the hand. This block was repeated every other day until seven injections had been done. He was then able to get along without further treatment and now has a useful arm. This is one of the newer branches of anesthesiology and one which every regional anesthetist should study and cultivate. Three things are essentially important: 1. Careful evaluation of results following diagnostic procedures to rule out any psychic element that may influence the patient's opinion. 2. Accurate localization and diagnosis prior to injection. 3. Observation of all the principles and precautions of safe regional anesthetic procedures.

DR. BRIAN C. SWORD, New York: The history of regional anesthesia demonstrates the ingenuity and enthusiasm of American physicians for new things with merit. To the Europeans belongs the major credit in the early development of this valuable contribution to medicine. It is regrettable that up until recent years it has suffered from lack of interest here among neurosurgeons, internists and anesthetists. Lack of proper solutions is a definite handicap. Those of us who have become intrigued with the potential possibilities have many times realized the need of a solution that has greater action on sensory fibers and less on motor fibers. Anesthetists who in daily practice are doing caudal transsacral blocks for many surgical procedures gain valuable experience in the technical accomplishment of various alcohol blocks for intractable pains of malignant growths in the pelvis. Regional anesthesia and diagnostic and therapeutic field block go hand in hand and the more versatile a clinical anesthetist becomes in this field of endeavor, a greater contribution will be able to offer his colleagues. The success or failure of therapeutic nerve block is based primarily on one of the fundamental principles governing all treatment in the practice of medicine; namely, a proper diagnosis. This of necessity means close cooperation between anesthetist and the doctor who refers the patient for a technical block of some type. The uncertainty of pain relief following the original block as well as the questionable duration of pain relief when accomplished has been a factor in deterring many anesthetists from attempting therapeutic and diagnostic field blocks. The short duration of pain relief does not necessarily imply that there has been an error in technic. The great advances accomplished in the use of therapeutic nerve block have been not only for the relief of pain but to treat disease as well. Therapeutic nerve block—the infant of the internist, the child of the surgeon and the playground of the anesthetist.

DR. PAUL W. SEARLES, Buffalo: I want to ask the authors if they have noticed any temperature changes of the fingers with the administration of the brachial plexus block in Raynaud's disease. I also wonder if they would cite their experiences in relation to the effects produced by subdural injections of alcohol into the spine of cancer patients and those with intractable pain.

DR. URBAN H. EVERSOLE, Boston: I should like to ask Drs. Rovenstine and Wertheim and Dr. McCuskey how their results in the treatment of long-standing thrombophlebitis compare with those in the treatment of acute thrombophlebitis.

DR. EMERY A. ROVENSTINE, New York: Drs. McCuskey and Sword referred to the lack of interest among anesthetists in therapeutic nerve blocking. If regional anesthesia and diagnostic nerve blocking belong to the practice of anesthesia, we should correct the fault. If it is surgery or more particularly neurosurgery, then we may be excused for practically ignoring it. However, it does seem that, if anesthetists develop or perfect technics for interrupting nervous pathways to permit painless surgery, these methods might well be used by them to treat and diagnose disease and relieve pain other than that

10. White, James C.: *Technic of Paravertebral Alcohol Injection*, Surg., Gynec. & Obst. 71: 334-343 (Sept.) 1940.

accompanying surgical manipulations. Criticism of available solutions is well taken. Alcohol is far from an ideal solution. We certainly need something to replace alcohol. We should make every effort to find it. The series of cases Dr. McCuskey mentioned in which lumbar sympathetic block was used to treat phlebitis is extremely interesting. This is one of the most dramatic and successful practices in the field of therapeutic nerve blocking. We have recently analyzed similar cases in Bellevue. Fifty-four patients have been treated. Seven were unsatisfactory and would not submit to a second injection; 4 were improved after only two blocks and 43 had satisfactory results. Most patients treated here have had early acute involvement. However, the block is certainly indicated in chronic cases. One case is that of a phlebitis for five months following hysterectomy which responded to one injection. I agree that interrupting the lumbar sympathetic pathway at any one point is sufficient. However, we still inject the first, second and third ganglions with procaine and lately we have been putting alcohol in the second. The matter of diagnosis has been stressed throughout the discussion and I think should be emphasized. The cases of Dr. McCuskey and the first case of Dr. Sword point definitely to the advantages in treating diseases other than those with associated pain particularly if vasospasm is present. We do not use brachial plexus block in the differential diagnosis of Raynaud's disease. It is simpler to do an ulnar block, and the results are satisfactory. I will not attempt to discuss the indications and limitations of subdural alcohol. When we employ such therapy, which is not often, the injection is made with the patient in the head down-feet down position, inclined forward, so that the apex of the angle formed is at the position of the principal nerve segment that we think may be involved.

PROTHROMBIN DEFICIENCY IN PULMONARY TUBERCULOSIS

CLINICAL RELATION AND SIGNIFICANCE IN HEMOPTYSIS

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WHITE HAVEN, PA.

Since 1937, when A. J. Quick demonstrated the relation of a low prothrombin level in the blood to a hemorrhagic tendency, there has been application of the Quick prothrombin test in the investigation of the bleeding tendency in many clinical entities. It has been established that a definite prothrombin deficiency is associated with the bleeding observed in obstructive and catarrhal jaundice.¹ A prothrombin deficiency has been observed in hemorrhagic disease of the newborn and in other clinical conditions, as has been well summarized by Snell and Butt.²

In a certain number of cases pulmonary tuberculosis is complicated with hemorrhage. This symptom of hemoptysis is most harassing and alarming to the patient. The incidence has been reported as ranging from 20 to 80 per cent. A. R. Masten³ found that 33.8 per cent of 1,000 patients admitted to a sanatorium because of pulmonary tuberculosis had hemoptysis before discharge or death. To determine whether there occurred any disturbance in the mechanism of coagulation, an investigation of the prothrombin concentration was made on the blood of patients with active and chronic pulmonary tuberculosis at the White Haven Sanatorium.

From the White Haven Sanatorium.

Dr. Frank A. Craig and the medical staff of the White Haven Sanatorium cooperated in this study.

1. Quick, A. J.: Nature of Bleeding in Jaundice, *J. A. M. A.* **110**: 1658-1663 (May 14) 1938.

2. Snell, A. M., and Butt, H. R.: Supplementary Report on Vitamin K, *J. A. M. A.* **113**: 2056 (Dec. 2) 1939.

3. Masten, A. R.: Haemoptysis in Pulmonary Tuberculosis, *Am. Rev. Tuberc.* **25**: 42 (Jan.) 1932.

MATERIAL AND METHOD

In 106 cases of pulmonary tuberculosis the prothrombin concentration in the blood was studied. Quantitative estimations of the prothrombin in the plasma were made according to the method of Quick.⁴ Oxalated plasma was recalcified in the presence of an excess of thromboplastin, and the clotting time was determined in seconds. The thromboplastin solution was made from a thymolized saline extract of freshly dried whole rabbit brain.

The obtained prothrombin times were then compared with the "normal control," which was obtained from 3 samples of normal plasma, and the determinations were repeated each time the thromboplastin solution was used. The percentage of normal was then computed by reference to the curve for each preparation of thromboplastin.

When the blood was taken, the temperature, pulse rate, respiratory rate, presence of cough and expectoration and weight curve were noted and roentgenologic estimate was made. Blood was taken as a routine for determination of the sedimentation rate and the cell volume. The routine laboratory tests and studies of the sputum were done for each patient.

The 106 patients with pulmonary tuberculosis were divided into those with minimal, with moderately advanced and with far advanced tuberculosis according to the roentgenologic standard as adopted by the National Tuberculosis Association and the American Sanatorium Association. Each group was divided by clinical status and roentgenologic study into subgroup A, patients who showed no evidence of healing or even of retrogression; subgroup B, those who showed evident improvement or a healing tendency, and subgroup C, those receiving some form of collapse therapy. The figures in table 1 are the results.

Roentgenologically, 11 patients, or 10.3 per cent, were classified as having minimal tuberculosis; 22, or 20.6 per cent, as having moderately advanced disease, and 73, or 69.1 per cent, as having far advanced tuberculosis.

In the group with minimal tuberculosis there was 1 patient, asymptomatic and afebrile, who had a recent area of infiltration in the upper lobe of the right lung. The remainder of this group was composed of patients who had shown evident improvement, clinically and roentgenologically, and had been taking regular exercise or working four to eight hours daily for two months to three years. One patient had been receiving treatments of artificial pneumothorax for three years and had been in active routine daily hospital work for the past two and one-half years.

Of the group with moderately advanced tuberculosis, 9 were members of the nursing staff who had been actively engaged in hospital work from three months to several years. Two had been treated regularly with artificial pneumothorax for more than three years and had been taking active exercise for one and one-half to two years. Three patients of this group had been admitted to the sanatorium shortly after they were found to be suffering from pulmonary tuberculosis.

Seventy-three patients had far advanced pulmonary tuberculosis. Forty-four were bedridden, were very toxic and either had been admitted recently to the sanatorium for therapy or during their course of

4. Quick, A. J.; Stanley-Brown, M., and Bancroft, F. W.: Study of Coagulation Defect in Hemophilia and in Jaundice, *Am. J. M. Sc.* **100**: 501 (Oct.) 1935.

sanatorium care had shown little tendency to improve clinically. There was a tendency to progression in some cases, even with a strict regimen of rest in bed. Fifteen patients, however, when studied, presented evident clinical and roentgenologic improvement in the tuberculous infection of the lung. These 15 were ambulatory and had no toxic manifestations. The fourteen remaining patients were treated surgically: One had thoracoplasty and 11 artificial pneumothorax, and 2 patients treated for one to two years with collapse therapy were in the course of having the collapsed lung reexpanded. Five of the 11 patients with pneumothorax had unsatisfactory collapse because of adhesions preventing the therapeutic measure from adequately controlling the disease. The remaining 6 with pneumothorax had a resulting collapse which was not totally satisfactory but controlled the disease so that the patients were symptomatically and clinically improved.

genologic improvement had a prothrombin concentration of more than 60 per cent of normal.

The concentration of prothrombin in the blood was determined in a series of nontuberculous, healthy persons. All of them had a concentration of more than 90 per cent of normal. In this study, a concentration of more than 90 per cent of normal is taken as the "normal range." Seventy-three per cent of the patients with minimal tuberculosis had prothrombin concentration within the normal range, and 100 per cent had a level over 70 per cent of normal. Sixty per cent of those with moderately advanced tuberculosis had a concentration within the normal range, and 86 per cent had a level over 70 per cent of normal. On the other hand, only 9.6 per cent of those with far advanced disease had a prothrombin concentration within the normal range, and 22 per cent had a concentration over 70 per cent of normal. The 16 patients with far advanced tuber-

TABLE 1.—Prothrombin Concentration (Quick) in One Hundred and Six Cases of Pulmonary Tuberculosis*

Percentage of Normal	Minimal Tuberculosis (11 Cases)				Moderately Advanced Tuberculosis (22 Cases)				Far Advanced Tuberculosis (73 Cases)			
	A†-1	B 9	C 1	Percentage	A 3	B 16	C 3	Percentage	A 44	B 15	C 14	Percentage
Over 100 . . .	1	5	.	54.6		6	.	22.7	..	..	..	0.0
100.00 . . .		1	1	18.2	1	7		36.4	..	4	3	9.6
80.00 . . .		2		18.2	1	.	1	9.1	..	3	1	5.5
70.00 . . .	.	1	.	9.0		2	2	18.2	..	4	1	6.8
60.00 . . .				0.0		2	..	9.1	2	3	2	9.6
50.00 . . .	..	.		0.0	1	.	..	4.5	8	1	3	16.4
40.00 . . .		..		0.0	.	..	..	0.0	22	..	3	34.2
30.00 . . .		..	.	0.0			.	0.0	11	..	1	16.4
20.00 . . .	..	.	..	0.0			..	0.0	1	..	..	1.4
10.00 . . .	.	..	..	0.0			..	0.0	..	..	..	0.0
Min. per Hour	Sedimentation Rate (Cutler)											
1-10 . . .	1	6	1	72.7	2	8	2	57.1	4	1	2	11.0
11-15 . . .	.	1	.	9.1	1	4		23.8	2	4	2	12.3
16-20 . . .	.	1	..	9.1		2	.	9.5	6	3	4	19.2
21-30 . . .	..	1	.	9.1	.	2	..	9.5	32	7	5	61.7
	Examinations of Sputum											
Positive . . .	..	.	..	0.0	1	2	1	18.2	43	8	9	83.4
Negative . . .	1	9	1	100.0	2	14	2	81.9	1	4	3	11.1
Occasionally positive	.		..	0.0	..		.	0.0	..	3	1	5.6

* Miss A. B. O'Neill assisted in part of the laboratory work.

† Subgroup A = no healing or retrogression; subgroup B = healing or improvement, subgroup C = collapse therapy.

ANALYSIS OF RESULTS

In 51 of the 106 patients studied, the prothrombin concentration was found to be less than 59 per cent of normal. Fifty of these had far advanced disease. One had moderately advanced tuberculosis. Forty-two of those with far advanced disease had active ulcerocaseous tuberculosis and were very toxic and ill. The sputum of every one contained the tubercle bacillus. The erythrocyte sedimentation rate of 94 per cent of the 42 was accelerated above the normal range. Indeed, 32, or 75 per cent, had a sedimentation rate as low as 21 to 30 mm. in one hour. Five of the 50 patients had been treated for two to seven months with artificial pneumothorax in one lung which was unsatisfactory and did not well control the disease and its accompanying toxemia. Two were undergoing reexpansion of the collapsed lung and had pleural effusions with systemic toxic symptoms, increased cough and expectoration and pain in the chest. One had chronic tuberculous osteomyelitis of the femur with far advanced chronic pulmonary tuberculosis.

Fourteen of the 15 patients who had far advanced tuberculosis and showed evident clinical and roent-

genologic improvement had a prothrombin concentration of more than 60 per cent of normal. Those with fibroclerative tuberculosis who after long periods of rest in bed presented evident clinical improvement and those with ulcerocaseous tuberculosis who under collapse therapy that controlled the disease fairly well experienced clinical and subjective improvement.

COMMENT

The relation of toxemia, in the animal body, to a low prothrombin concentration in the blood was pointed out as early as 1937.¹ Judging from my study, there appears to be a relation between the prothrombin concentration in the blood and the degree of toxemia, as measured by clinical standards, in pulmonary tuberculosis. There seems to be a less certain relation between the prothrombin level and the extent of the active tuberculous involvement. In chronic, inactive tuberculosis, regardless of the original extent, the prothrombin concentration is usually within the normal range. From the material studied, it is suggested that as regression takes place in the tuberculous lesion, so that the patient taking graded degrees of exercise does

not show clinical signs of toxemia, the study of the prothrombin concentration usually shows an elevation, provided, of course, that there is no complicating condition. In most cases studied, the prothrombin level tended to parallel the clinical status of the patient. There was no constant parallel between this level and the erythrocyte sedimentation rate (uncorrected for anemia, if present) in my study. One patient with minimal tuberculosis, who showed no clinical evidence of toxemia while doing routine nursing duties, had a prothrombin level of 83 per cent of normal, whereas the sedimentation rate was reported as 27 mm. in one hour. One patient with far advanced tuberculosis, not included in this study, had a sedimentation rate of 4 mm. an hour, whereas the prothrombin level was reported as 55 per cent of normal; this patient exhibited toxemia on the least amount of exercise. It might be suggested that the evaluation of the true role of prothrombin concentration in the activity of pulmonary tuberculosis waits on determinations at regular intervals throughout the clinical course of the disease in an appropriate number of cases and comparison at or near those intervals with other clinical, laboratory and roentgenologic studies.

SIGNIFICANCE OF PROTHROMBIN CONCENTRATION IN SURGICAL PROCEDURES ON TUBERCULOUS PATIENTS

Seventeen patients with pulmonary tuberculosis who were treated with artificial pneumothorax were studied; 13 had far advanced tuberculosis. Five had had unsatisfactory collapse established, which did not adequately control the disease. Further surgical procedures might be indicated as the logical approach to these problems. The prothrombin concentration of the 5 ranged between 59 and 35 per cent of normal. The disturbance in the mechanism of coagulation which may result from a prothrombin level of this degree may add to the complications both operatively and postoperatively, as far as the welfare of the patient is concerned. Determination of the significance in surgical procedures of the prothrombin concentration is dependent on further study and observations.

SIGNIFICANCE OF PROTHROMBIN DEFICIENCY IN HEMOPTYSIS IN PULMONARY TUBERCULOSIS

In recent months I have been making detailed reports on every case of frank hemorrhage and blood-streaked sputum, however slight the streaking (table 2).

Over a period of six weeks, there were 13 patients (6.5 per cent) in the sanatorium who had frank hemorrhage or streaking of bright red blood in the sputum. Three had acute infections of the upper respiratory tract, and in the course of one to three days after onset had only the slightest streaking, which was of no consequence. Among the remaining 10, 3 had streaks of bright red blood in the sputum, the condition lasting for one to three days and not being associated with infection of the upper respiratory tract. Seven patients had frank hemoptysis, the discharge varying from 1 to 3 ounces (29 to 87 cc.) of bright red blood, with resulting streaking for one to twelve days. Eight (80 per cent) of the 10 patients had a prothrombin concentration of 49 per cent to 35 per cent. All had far advanced disease. Two who had frank hemorrhage had a prothrombin level between 79 and 70 per cent of normal. One of these had a cell volume of 38.5 per cent; the other had a normal cell volume. Both had

far advanced disease which had undergone evident improvement over the course of many months of sanatorium care and had had a sudden setback of hemoptysis, followed by streaking in 1 case, with severe cough, for twelve days. The mechanical and physiologic factors, such as permeability, intrapulmonary blood pressure and congestion, must always be kept in mind.

The treatment of pulmonary hemorrhage has been unsatisfactory. Tissue extracts, such as thromboplastin, have not yielded effective results. In 1926, C. A. Mills⁵ concluded from his studies of hemorrhage in typhoid fever and tuberculosis that there appeared to be a disturbance in the blood which interfered with the normal coagulation. He recommended blood transfusion as the surest measure to control hemorrhage in these diseases. A. R. Masten³ substantiated this observation in tuberculosis. Quick¹ found that the prothrombin level of the blood was elevated after a transfusion of fresh blood in animals with hemorrhagic tendency associated with a low prothrombin concentration. J. Rhoads⁶ reported that certain vitamin K substrates produced an increase in blood prothrombin in a

TABLE 2.—Prothrombin Concentration (Quick) in Thirteen Cases of Blood-Streaked Sputum or Frank Hemorrhage

Percentage of Normal	Frank Hemorrhage	Streaking	Slight Streaking with Colds, U. R. I.
	7	3	3
Over 100.....	..	..	..
100-90.....	..	..	..
89-80.....	..	..	1
79-70.....	2	..	1
69-60.....	..	..	..
59-50.....	..	..	1
49-40.....	4	2	..
39-30.....	1	1	..
29-20.....	..	..	..
19-0.....	..	..	..

majority of the cases of hypoprothrombinemia which he studied. In a small percentage of the cases studied by Rhoads, however, there was no improvement of the prothrombin level after vitamin K had been given.

The stage being set for pulmonary hemoptysis, for example by a softening of caseous areas of tuberculous infection, it would seem from the small number of cases that the prothrombin deficiency may be a significant factor to consider, with other established factors, in the problem of control of hemoptysis in pulmonary tuberculosis in certain cases.

In this regard, 4 of the patients listed in table 2 as having frank hemorrhage associated with low prothrombin levels of 49 to 35 per cent were treated with synthetic vitamin K.

CLINICAL COURSE IN FOUR CASES

CASE 1.—Mrs. E. S., aged 56, had far advanced ulcerocaseous pulmonary tuberculosis. She was toxic and febrile, and had a severe cough with a moderate amount of expectoration. The cell volume was 44 per cent and the blood pressure 148 systolic and 92 diastolic. On Nov. 24, 1940 there was a sudden hemorrhage of 3 ounces (87 cc.) of bright red blood after a severe attack of coughing. Ten cc. of thromboplastin was

5. Mills, C. A.: Hemorrhages: Their Significance and Methods of Treatment, *Am. J. M. Sc.* 172:71 (July) 1926.

6. Rhoads, J. E.: Symposium on Fluid and Electrolyte Needs of the Surgical Patient: Physiologic Factors Regulating the Level of the Plasma Prothrombin, *Ann. Surg.* 112:568 (Oct.) 1940.

given intravenously and the administration of calcium and vitamin C by mouth was started. On November 26 the patient was still coughing up mouthfuls of bright red blood at irregular intervals. Twenty cc. of thromboplastin was given intravenously. The next morning the patient was still coughing up bright red blood and was not improved. In the afternoon, the prothrombin level was determined at 47 per cent of normal. Two mg. of menadione ("proklot," Lilly) was given by mouth with 3 grains (0.19 Gm.) of bile salts. One mg. of menadione with 3 grains of bile salts was given every six hours for ten doses.

On November 28 dark streaked sputum was noticed in the morning, but the amount of blood was definitely less. On November 29 there were some dark red streaks of blood in the sputum. On November 30 there were only occasional streaks in the sputum, and by December 1 the sputum was clear. On December 4 the prothrombin level was 130 per cent of normal.

CASE 2.—M. S., a woman aged 22, had far advanced pulmonary tuberculosis. The temperature was 99.3 F., the pulse rate 108, the respiratory rate 26 and the blood pressure 120 systolic and 70 diastolic. The cell volume was 34 per cent. She was completely bedridden.

On December 17, 1940 there was hemoptysis, with a discharge of 3 ounces (87 cc.) of bright red blood. The prothrombin level was 45 per cent of normal. One mg. of menadione was given with 3 grains (0.19 Gm.) of bile salts every six hours for ten doses. On December 18, eighteen hours later, there were only occasional dark red streaks in the sputum. The following day the sputum was clear, and there has been no bleeding since. On December 21 the prothrombin level was 83 per cent of normal.

CASE 3.—N. R., a girl aged 16, had far advanced ulcerocaseous tuberculosis in both lungs. She was bedridden. The temperature was 97.3 F., the pulse rate 84 and the respiratory rate 20. The patient had been losing weight and had severe cough. The cell volume was 34 per cent. The sputum had been streaked with bright red blood for four weeks since admission. On December 9, 1940 the level of prothrombin was 37 per cent of normal. The patient was given 1 mg. of menadione with 3 grains of bile salts every six hours for ten doses. She later was reported "to have vomited after taking pills." On December 11 the prothrombin level was 33 per cent of normal. There was no effect on blood streaking. On December 20 the patient was given 1 mg. of 4-amino, 2 methyl 1 naphthol as hydrochloric acid ("synkamin," Parke, Davis & Co.) intramuscularly every six hours for four doses. The next day she did not have streaks of blood in the sputum. The prothrombin level was 60 per cent of normal. On Jan. 1, 1941 the patient again started to have sputum streaked with bright red blood. The prothrombin level was 47 per cent of normal.

CASE 4.—A. C., a youth aged 21, an Italian, had far advanced fibroulcerocaseous tuberculosis in both lungs. The temperature was 98.3 F., the pulse rate 70 and the respiratory rate 26. The weight was stationary. There was little cough and expectoration. The patient remained in bed. On Dec. 31, 1940 there was hemoptysis, with a discharge of 3 ounces of bright red blood, followed by heavy streaking of the sputum. The prothrombin level was 47 per cent of normal. The patient was given 1 mg. of menadione with 3 grains of bile salts every six hours for ten doses. On Jan. 1, 1941 the sputum was streaked with dark blood. The following day the sputum was clear, and it remained so. On January 3 the prothrombin level was 140 per cent of normal.

It is suggested from the material at hand that the prothrombin deficiency associated with pulmonary tuberculosis can be relieved, in some cases, by the administration of vitamin K. The clinical observation that the elevation of the prothrombin concentration of blood is accompanied by an increased tendency to

clotting of the blood would indicate the possibility that synthetic vitamin K may be an addition to the armamentarium in the control of hemoptysis in certain cases of pulmonary tuberculosis. The parenteral route of administration (intravenous or intramuscular) is apparently the best for patients who are very toxic and who have gastrointestinal disturbances which may affect absorption.

During the administration of the synthetic vitamin K substances there were no untoward effects. One patient complained of itching of the skin over the face, arms and chest for one day during the treatment. One patient was reported to have vomited within one hour after receiving the medication by mouth. The same person had no vomiting associated with receiving the vitamin K intramuscularly (which was an aqueous solution).

Case 3 illustrates that although the prothrombin level may be elevated, the attained level does not persist. A gradual depression of the prothrombin concentration is observed when tuberculous patients are studied at intervals.⁷ The rapidity with which this depression occurs seems to be related, in some way, to the degree of toxemia present.

SUMMARY AND CONCLUSIONS

Among 106 cases of active and chronic pulmonary tuberculosis (10.3 per cent of minimal, 20.6 per cent of moderately advanced and 69.1 per cent of far advanced tuberculosis) studied in regard to the concentration of prothrombin in the blood, a significant deficiency of prothrombin was found in 51.

Fifty of the patients had far advanced tuberculosis, and 5 of these were receiving treatment with artificial pneumothorax with resulting unsatisfactory collapse of the diseased lung. Two patients were undergoing reexpansion of the collapsed lung.

Among the patients, seventy-three per cent with minimal, 60 per cent with moderately advanced and 9.6 per cent with far advanced tuberculosis had a prothrombin concentration within the normal range. Sixty-eight and one-half per cent of those with far advanced tuberculosis had a prothrombin concentration below 59 per cent of normal.

There was no constant relation between the prothrombin concentration and the sedimentation rate. The status as to prothrombin level appeared to coincide with the clinical and roentgenologic status of the majority of the patients.

It is suggested that the prothrombin concentration should be determined in every case of hemoptysis in pulmonary tuberculosis. In 4 cases of frank hemoptysis with associated prothrombin deficiency, the elevation of the blood prothrombin level on the administration of vitamin K, orally and parenterally, was a likely factor in the control of the hemoptysis.

The significance of the prothrombin concentration in surgical procedures on patients with pulmonary tuberculosis must await further study.

The prothrombin concentration in the blood of patients with tuberculosis seems to be related, in some way, to the toxemia resulting from the existing tuberculous infection in the lung.

7. Unpublished data.

CONCENTRATION METHOD OF RADIO-
THERAPYFOR CANCER OF THE MOUTH, PHARYNX AND
LARYNXMAX CUTLER, M.D.
CHICAGO

My purpose in this paper is to present the results of recent efforts to influence the more radioresistant forms of cancer of the mouth, pharynx and larynx by means of new methods of roentgen ray and radium treatment. The study is based on the observation of some 850 cases of cancer of the mouth, pharynx and larynx treated in the Chicago Tumor Institute and the Hines Veterans Hospital.

The divided dose technic, generally known as the "Coutard method," or some modification of it is the most prevalent form of roentgen ray treatment now in use. So much confusion surrounds the use of the term "Coutard method" that an effort to clarify this term may be useful. First it should be pointed out that Coutard¹ has never adhered to a rigid technic or to a single principle of treatment. The technic to which the term "Coutard method" is generally applied is based on the use of moderate daily doses of roentgen rays until a pronounced reaction in the mucous membrane and skin is produced. Decided variations in daily and total doses and in the intensity of the reactions are included in technics described as the "Coutard method." After using a treatment time of thirteen to sixteen days for several years, Coutard prolonged the time first to eighteen days, then to twenty days and finally to twenty-five days, using daily doses of 400 and 300 roentgens. Several years later he prolonged the time still further to thirty, forty and fifty days with a corresponding reduction in the daily dose to 250, 200 and 150 roentgens. In addition to varying the total treatment time and the daily dose, Coutard has explored various other methods including preparatory treatment, supplementary treatment, periodicity and the treatment of the tumor bed with protection of the tumor. It is obvious, therefore, that the use of the term "Coutard method" without specifications is indefinite and misleading.

These studies were made in collaboration with the staff of the Chicago Tumor Institute and the Cancer Unit of Hines Veterans Hospital. I am especially indebted to Coutard for stimulating many new ideas in roentgen therapy in the Chicago Tumor Institute (1938-1941).

RADIOSENSITIVITY

The radiosensitivity of a tumor is related to the site of origin, stage of disease, papillary or infiltrating character and histologic structure.

The site of origin of a carcinoma frequently determines its radiosensitivity; thus, a carcinoma arising in the false cords or epiglottis is generally radiosensitive not only in its early stages but even when advanced, whereas a carcinoma of the true cord is radiosensitive only in its early stages. Once the lesion has infiltrated and immobilized the underlying muscles it is radioresistant.

The old classification of cancer into two main forms, papillary and infiltrating, has an important significance

in relation to radiosensitivity, for the general rule holds that the papillary forms are sensitive and the infiltrating forms resistant. It should be noted, however, that there are exceptions.

The microscopic structure is of help in estimating radiosensitivity and guiding treatment. Information from this source is of greatest value when interpreted in the light of the clinical and gross anatomic factors.

No sharp line of demarcation can be drawn between radiosensitive and radioresistant lesions. The quality of radiosensitivity varies in degree, and there is no accurate method of expressing different degrees of radiosensitivity. This fact makes it exceedingly difficult to evaluate new methods of treatment, and the critical observer who effects a startling result by a new method of irradiation is haunted with the possibility that the result may have been due to a high degree of radiosensitivity rather than to the special method employed. In order to avoid this pitfall it is important to select lesions in which a high radiosensitivity can be excluded with reasonable certainty. Examples of such lesions are (1) extensive infiltrating carcinoma of the anterior two thirds of the tongue, which is highly differentiated (adult hornifying squamous carcinoma) and (2) carcinoma originating in the true cord and infiltrating and immobilizing the underlying muscle. Lesions of this type have been selected in testing the effectiveness of new radiotherapeutic methods now reported.

CLINICAL-PATHOLOGIC CLASSIFICATION IN RELATION
TO RADIOSENSITIVITY

Cancers of the mouth, pharynx and larynx fall into two broad general groups from the point of view of radiosensitivity and radiocurability:

1. *Radiosensitive Group*.—Lesions originating in the mucous membrane overlying loose connective tissue which lack the power to infiltrate the underlying muscle and which grow for long periods as movable non-infiltrating lesions. Carcinomas of this type sometimes reach large proportions and form bulky masses. They generally arise in cylindric cells and are undifferentiated. The regional lymph nodes which become the seat of metastases are comparatively soft and remain circumscribed and movable even when they have become quite large. In this respect they resemble the primary lesion. Lesions of this type are highly malignant and as a rule highly radiosensitive in spite of their extent or the presence of regional metastasis. Classic examples are cancers originating in the tonsil, epiglottis, false cords, pyriform fossa and aryepiglottic fold.

2. *Radioresistant Group*.—Lesions arising in the mucous membrane overlying dense connective tissue and having a tendency to early infiltration of the underlying muscle with early fixation of the surrounding structures. Metastasis generally occurs later than in the former group and involves the regional lymph nodes in close proximity to the lesion. The lymph nodes are firm and tend to early fixation in contradistinction to the other group, in which the lymph nodes are softer and tend to remain circumscribed and movable over long periods. Histologically these lesions exhibit adult, differentiated morphologic features. In their early stages, when the growth is still superficial, they are radiosensitive and often radiocurable in spite of their structure. Once the underlying muscle has become invaded and fixed, the lesion becomes more radioresis-

Aided by a grant from the National Cancer Institute.
1. Coutard, Henri: Roentgen Therapy of Epitheliomas of Tonsillar Region, Hypopharynx and Larynx from 1920 to 1926, *Ann. J. Roentgenol.* 28: 313 (Sept.) 1932; Present Conception of the Treatment of Cancer of the Larynx, *Radiology* 34: 136 (Feb.) 1940.

tant. An example of this type is infiltrating, adult, hornifying, squamous carcinoma of the anterior two thirds of the tongue.

EFFORTS TO STERILIZE THE RADIO- RESISTANT LESIONS

The present method of using divided daily doses of roentgen rays for twenty to fifty days with a total dose adequate to produce characteristic cutaneous and epithelial reactions has resulted in the cure of approximately 25 per cent of carcinomas of the mouth, pharynx and larynx. This includes all stages of the disease and all histologic forms. The 75 per cent failures must be attributed to the radioresistance of the lesions and the extent of the disease. By separating cancer of the mouth, pharynx and larynx into two broad groups on a clinical-pathologic basis, it becomes perfectly clear that, with rare exceptions, the 25 per cent of cures by external irradiation have occurred in the first or radiosensitive group and the 75 per cent of failures in the second or radioresistant group. Not until knowledge of radiosensitivity reached a stage in which a clinical-pathologic classification became feasible was it possible to make this interpretation.

Since 1938 efforts have been under way in the Chicago Tumor Institute and the Hines Hospital to extend the effectiveness of external irradiation to the more radioresistant lesions which hitherto failed to respond to the former methods of roentgen and radium therapy; i. e., to group 2. The following topics have been the subject of investigation:

The use of higher voltage (400 kilovolts) and telecurietherapy (10 Gm. radium bomb); shortening of the time interval with a corresponding increase in the daily dose; the use of increasing daily doses through diminishing ports; the use of an interrupted treatment administered in two cycles; preparatory treatment; supplementary treatment; treatment of the tumor bed with protection of the tumor; treatment through lead perforations.

Up to this time I² have not seen any beneficial results from the treatment of the tumor bed with protection of the tumor. The same holds true for the supplementary treatment. Certain benefits have been observed from the use of preparatory treatment in extensive and infected lesions. There appear to be advantages in the use of lead perforations in the treatment of certain lesions, and a separate paper on this subject is in preparation.

One principle of roentgen and radium therapy has arrested attention: I have called it the method of concentration. The treatment may be administered continuously or in two cycles interrupted by a rest period of eleven to fifteen days.

THE METHOD OF CONCENTRATION

The basis of this technic is the use of large daily doses over a short treatment period (nine to twelve days) and a total dose sufficient to produce an "epithélite" and "epidermite." In selected cases the daily dose is increased as the size of the port is diminished.

Voltage.—Experience with the use of voltages higher than 200 kilovolts (400,000 to 1,000,000) is gradually accumulating, and certain advantages of higher voltage have been observed and recorded; but, so far as I know,

there is no published report of a comparison between the use of 200 kilovolt roentgen rays and higher voltages based on comparative clinical studies in which voltage has been the only variable factor. Not until such studies are available will it be possible to draw definite conclusions. While the results of such studies are being awaited, certain observations are pertinent.

Clinical experience supports physical observation that the cutaneous reactions for equal doses diminish progressively as the wavelength becomes shorter. This observation is based on the use of 200 kilovolt roentgen rays, 400 kilovolt roentgen rays and telecurietherapy and confirmed for million volt roentgen rays by Failla and Quimby,³ and by Parker.⁴ Other advantages of higher voltages are an increased depth dose and a more restricted beam of radiation. The latter may account for the result that radiation sickness is less pronounced and less common with the use of higher voltages and telecurietherapy. In certain lesions higher voltages and telecurietherapy permit the use of a single field, with a corresponding improvement in the precision of treatment. The comparative value of roentgen therapy and telecurietherapy also awaits adequate clinical studies with control of all possible factors except the quality of the ray. Such studies are now in progress.

Intensity (number of roentgens per minute).—In the development of the new technic, intensities varying from 3 roentgens per minute to 10 roentgens per minute have been used. Edema and serious injury to the connective tissue and blood vessels can be avoided by the use of low intensities. It is suspected that it would be dangerous to apply the new technic with higher intensities and I warn against it. The proposed technic involves irradiation with large doses which may produce effects on the normal tissues just short of permanent damage.

The Fields.—In the treatment of cancer of the mouth, from one to three fields are used, depending on the site and extent of the lesion. In the treatment of cancer of the pharynx and larynx, two lateral fields are generally used.

As a rule the peripheral portions of a cancer are more radiosensitive than its central portion at or near the point of origin. Many carcinomas regress under external irradiation and leave a central unsterilized radioresistant remnant which under some circumstances is best treated with a sharp, intensive radiation by the interstitial method. Based on the knowledge that the central portion of a carcinoma is more radioresistant and therefore requires more intensive irradiation, a technic has been developed in which the size of the field is gradually reduced and the daily dose gradually increased. If the supposition is correct that the periphery of a tumor is more radiosensitive than its center, this technic permits a more efficient distribution of the irradiation. Radiation energy, which is so often wasted on the normal tissues in the periphery of a tumor, is conserved by means of this technic for the treatment of the central, radioresistant portion, which is generally the site of recurrence. Thus my associates and I have administered safely 1,400 roentgens in two sessions in one day through a port measuring 3 by 3 cm. This technic is used in carefully selected cases in which the lesion is small, fixed and highly radioresistant. In the treatment of intrinsic cancer of the larynx we generally

2. Cutler, Max: Radiosensitive Intraoral Tumors: A Clinical Study, *Arch. Surg.* 15: 2303 (June) 1929; The Problem of Radiosensitivity, *J. A. M. A.* 103: 1204 (Oct. 20) 1934; Cancer of the Larynx: Relation Between Gross Anatomy, Microscopic Structure and Radiosensitivity, *ibid.* 115: 1339 (Oct. 19) 1940.

3. Failla, Gioacchino, and Quimby, Edith H.: Decrease of Skin Damage by Deflecting Secondary Electrons from a Beam of One Million Volt X-Ray, read before the American Physical Society, Washington, D. C., in April 1940.
4. Parker, H. M.: The Dependence of the Back-Scattering of Roentgen Rays in a Phantom on Focal Distance, Quality of Radiation and Field Size, *Acta radiol.* 16: 785 (No. 6) 1935.

begin with a field of 48 sq. cm. This is reduced gradually to a final field of 12 sq. cm. and sometimes 6 sq. cm., depending on the original size, location and nature of the lesion. Great care and precision are necessary with the use of smaller fields. In the Chicago Tumor Institute all x-ray machines are provided with a light centering device and a diaphragm which permit localization and flexibility. Great care must be taken in the immobilization of the patient, and the field must be checked during the treatment.

Time.—For many years efforts have been made to determine the optimal time over which a given malignant tumor should be irradiated. Regaud's⁵ original experiments with the ram led him to suggest a total period of twenty to twenty-five days, but his later experiments suggested a treatment time of ten days. One highly important fact emerges from our experience in radiotherapy, namely that the more radioresistant the lesion the shorter must be the treatment time and the larger the daily dose. A superficial papillary carcinoma of the true cord, for example, can be sterilized with 6,000 roentgens given in small daily doses over a period of forty to fifty days. A carcinoma of the true cord which has infiltrated the underlying muscle and caused a partial or complete fixation of this structure cannot be sterilized by this method but in a certain proportion of cases can be sterilized when 6,000 roentgens are given over a period of twelve days or less. It is clear that the more radioresistant lesions require not only an adequate total dose but an adequate daily dose. In other words, an adequate total dose distributed over a period of such length that the daily dose falls below a certain level fails to sterilize the more radioresistant carcinomas. Different total treatment periods varying between four days and eighteen days are being tested. The treatments are given twice daily and continuously. The optimal period has not yet been determined.

Daily and Total Doses.—One of the questions that arises with regard to dosage is whether the more radio-sensitive forms of cancer should be treated with smaller total doses than the more radioresistant types. This conception is a fallacy. It is hazardous to administer a less intensive treatment to a supposedly more radio-sensitive lesion. There are, of course, exceptions to this rule. It seems safer to treat all lesions on the assumption that they belong to the more radioresistant variety. Thus we approach the radiation of a malignant lesion on the basis of the maximum treatment that can be safely tolerated by the patient and by the normal tissues surrounding the growth.

Telecurietherapy (10 Gm. radium bomb).—The apparatus contains 10 Gm. of radium and is used at 12.5 cm. distance. The ports vary from 10 cm. in diameter to 4 sq. cm. An effort is under way to determine the comparative value of telecurietherapy and roentgen therapy. All factors that can possibly be controlled are made comparable so that the principal variable factor is the quality of the ray. Lesions of the mouth, pharynx and larynx are selected for their similarity as to site of origin, extent of disease and structure. Such comparable cases are treated by the different methods in an effort to determine the com-

parative results. It can be said at this time that telecurietherapy is a most useful method of irradiation, and some highly interesting results have been obtained especially since the "method of concentration" and the "interrupted method" of irradiation have been employed.

INTERRUPTED TREATMENT

One group of cases has been treated in two cycles separated by an interval of eleven to fifteen days. Such treatments have been executed with roentgen rays and with telecurietherapy with some interesting results. We have found this technic especially useful in the treatment of carcinoma of the pharynx and larynx. The severe reactions which are sometimes observed by the continuous method can be avoided by treating in two cycles, and the evidence so far indicates fully as pronounced an effect on the lesion as when the treatment is continuous. In some instances we have the impression that the results are superior to those which might have been obtained with the continuous method under similar circumstances. It should be noted that the interrupted method utilizes the principle of concentration; i. e., the treatments are given in a short interval with high daily doses and in suitable cases with increasing doses through diminishing ports. The number of cases treated is not sufficient nor is the time interval adequate to permit definite conclusions, but experience so far encourages the continuation of this method and it is recommended as a highly useful technic, especially in cancer of the pharynx and larynx.

COMMENT

A new technic of external radiation has been presented which appears to be more effective in the radioresistant forms of cancer of the mouth, pharynx and larynx than the methods of external irradiation now in use. It is called the method of concentration.

Since this method has been used only three and one-half years, nothing can be said of the permanence of the results. It has been established, however, that certain carcinomas of the mouth, pharynx and larynx which failed to respond to all other methods of external irradiation have shown decided regression and in many instances have disappeared completely under the new method of external irradiation.

Treatment has been executed with telecurietherapy (10 Gm. radium bomb) and with roentgen rays (200 and 400 kilovolts).

The underlying basis of the "method of concentration" may be stated as follows:

1. The conception that the more radioresistant forms of cancer require a higher daily dose and a shorter total treatment period (twelve days or less).

2. The administration, in selected cases, of an increasing daily dose through a diminishing port in order that the central, more radioresistant portion of the lesion may receive a much larger dose than is possible when the size of the port remains constant.

3. The administration of an adequate dose sufficient to produce the classic epidermite and epithélite, such dose representing the maximum treatment that can be tolerated by the normal tissues of the tumor bed.

The interrupted method of irradiation using the principle of concentration has proved especially satisfactory. The definite impression has been gained that the periods of rest to the normal tissues and to the patient are highly advantageous and the effect on the tumor appears at least as pronounced as with the continuous method of treatment. Should further studies confirm the present impression that the sterilization of the lesion is as

5. Regaud, C., and Dubreuilh, G.: Perturbations dans le développement des œufs fécondés par des spermatozoïdes roentgenisés chez le lapin, *Compt. rend. Soc. de biol.* 64: 1014, 1908. Regaud, C., and Lacassagne, A.: Sur l'évolution générale des phénomènes déterminés dans l'ovaire de la lapine par les rayons X, *ibid.* 74: 601, 1913. Regaud, C.: Le rythme alternant de la multiplication cellulaire et la radiosensibilité du testicule, *ibid.* 86: 822, 1922.

certain by this method as by the continuous method, we shall substitute the "method of interruption" for the "continuous method" in suitable cases.

These technics are in no way intended to be final. They merely represent what seem to be advances in external irradiation and they are described in the hope that others will utilize them and publish their results.

SUMMARY

A new principle and technic of external irradiation gives a more pronounced effect on the more radio-resistant forms of cancer of the mouth, pharynx and larynx than the methods of external radiation now in use. This technic has been called the method of concentration. It can be applied daily and continuously or in two cycles interrupted by a rest period of eleven to fifteen days.

21 West Elm Street.

THE IMPORTANCE OF AIR-BORNE PATHOGENIC BACTERIA IN THE OPERATING ROOM

A METHOD OF CONTROL BY STERILIZATION OF
THE AIR WITH ULTRAVIOLET RADIATION

DERYL HART, M.D.

DURHAM, N. C.

During the first five and one-half years of the Duke Hospital, as a result of extensive studies carried out in an attempt to determine the cause of "unexplained infections" in clean wounds, we were forced to the conclusion that pathogenic bacteria floating in the air and sedimenting on the wound and sterile field were the cause of most of the unexplained infections in our operating rooms. We were unable to control this source of infection despite many changes in technic until ultraviolet radiation (predominantly 2,537 angstroms) was utilized to kill the bacteria (and fungi) in the air or after they sedimented on the sterile field.

During the past five and one-half years since this technic of air sterilization was adopted the infection rate in clean wounds has been reduced to a small fraction of the previous level, and where it was used we have had no death from an infection in a clean wound. We offer this experience in proof of our conclusions as to the source of these infections and as an example of what can be accomplished when this source of infection is brought under control.

During the years 1930-1936, and to a lesser extent since that time, our entire "aseptic technic" has been checked repeatedly by bacteriologic cultures. The following facts were determined:

1. The usually accepted "aseptic technic" was satisfactory as far as the sterilization of supplies, instruments and so on was concerned. Fresh laundry was usually free of pathogenic bacteria. The surface of the skin of the personnel and patient after preparation for operation was usually free of organisms and after a period of moderate perspiration it usually showed only staphylococci, usually albus, rarely aureus, and almost never the hemolytic *Staphylococcus aureus*, the cause of most of our severe infections.¹

2. Over 90 per cent of our wounds infected from an unexplained source contained staphylococci, predominantly aureus, and usually hemolytic.¹

3. Staphylococci could invariably be recovered from the air of the operating rooms during occupancy. At times hemolytic yellow staphylococci could be grown on sterile Petri dishes of blood agar exposed to the air near the operative incision during the operation and could be identified before the infection caused by a similar organism showed up in the wound. These organisms produced a powerful toxin and the patients so infected at times had a temporary urinary suppression followed by hematuria.²

4. Cultures made in over forty operating rooms in sixteen states showed the widespread distribution of pathogenic bacteria in the air of operating rooms and suggested that such a condition is universal.³

5. Operating room air contamination with staphylococci (over 90 per cent of all organisms recovered) was in general highest during the colder months and lowest during the summer. Also during the summer the hemolytic *Staphylococcus aureus* was much less frequently recovered from the air.⁴

6. Severe staphylococcic wound infections occurred almost entirely not only during the colder months but during the periods in the colder months when the air contamination with *Staphylococcus aureus*, particularly the hemolytic, was highest.¹

7. Quantitative studies to determine the degree of nose and throat contamination of 10 men, and to correlate this with the degree of air contamination of the room in which they worked, showed the two conditions to be roughly parallel over a period of twelve months during which the study was carried out. This held not only for gross numbers but also for the flora, particularly the presence or absence of hemolytic yellow staphylococci.²

8. Severe streptococcic throat infections were rare and streptococcic wound infections occurred in only 5 per cent of the total infections in clean operative wounds. Most of these were in one surgical specialty service.¹

9. Cultures of the freshly prepared hands of the personnel or skin of the operative region seldom showed a positive growth, but after an operation on a hot day many staphylococci (usually a pure culture of *Staphylococcus albus*) could be cultured from the skin of the patient or the hands of the operating team.⁵

10. During the summer months when perspiration was most profuse but the nose and throat contamination was low, severe infections were rare and there was no fatal infection in a clean wound.⁶

11. Sedimenting bacteria recoverable on an exposed plate of blood agar diminish rapidly after cessation of occupancy and dropped from fifty to one hundred or more colonies per hour of exposure during occupancy to zero to four colonies as an average of many expo-

2. Hart, Deryl, and Schiebel, Herman M.: Role of the Respiratory Tract in Contamination of Air: A Comparative Study, *Arch. Surg.* 38: 788-796 (April) 1939.

3. Hart, Deryl: Pathogenic Bacteria in the Air of Operating Rooms: Their Widespread Distribution and the Methods of Control, *Arch. Surg.* 37: 521-530 (Oct.) 1938.

4. Hart, Deryl, and Gardner, C. E., Jr.: Sterilization of the Air in the Operative Region with Bactericidal Radiant Energy: Results in Its Use in Two Hundred and Eighteen Operations, *Tr. South. S. A.* 40: 376, 1937. Hart and Schiebel.²

5. Hart, Deryl, and Upchurch, S. E.: Postoperative Temperature Reductions Obtained by Sterilizing the Air with Bactericidal Radiant Energy: Seasonal Variations, *Ann. Surg.* 110: 291-306 (Aug.) 1939.

6. Hart, Deryl: Sterilization of the Air in Operating Room with Bactericidal Radiation: Results from Nov. 1, 1938 to Nov. 1, 1939 with a Further Report as to Safety of Patients and Personnel, *Arch. Surg.* 41: 334-350 (Aug.) 1940. Hart and Upchurch (footnotes 1 and 5).

From the Department of Surgery, Duke University School of Medicine and Duke Hospital.

1. Hart, Deryl, and Upchurch, Samuel E.: "Unexplained Infections" in Clean Operative Wounds: The Importance of the Air as a Medium for the Transmission of Pathogenic Bacteria and Bactericidal Radiation as a Method of Control: Analysis of Over 5,000 Operations Covering a Period of Ten and One Half Years, *Ann. Surg.*, to be published.

tures after eighteen to twenty hours. The latter number could not be appreciably increased by stirring up the air in the well kept operating room with electric fans.²

12. As soon as the room was reoccupied the air contamination rose rapidly.²

13. Other things being equal, the degree of air contamination varied directly with the duration of occupancy, the number of occupants and the degree of nose and throat contamination of the occupants and was further influenced by the amount of activity and talking and by the efficiency of the ventilating system in supplying to the room air free of bacteria.⁷

14. The conventional gauze mask did not prevent this air contamination. Experimentally it would not stop these bacteria when they were atomized into the air of an experimental apparatus, the air of which was then filtered through the mask.⁸

15. The degree of contamination of the front of the operating uniform (nurses, doctors or orderlies) varies directly with the nose and throat flora of the wearer and the length of time the uniform has been worn. These uniforms for all personnel should, of course, be freshly laundered each day.¹

From these facts we were forced to the conclusion that pathogenic bacteria given off from the noses and throats of the occupants of the modern well run operating room, floating in the air and sedimenting on the sterile field comprise the greatest breach in our present day aseptic technic and present the greatest hazard of infection in large operative wounds. This is particularly true in those wounds in which hemostasis may be inadequate, trauma inevitable and immobility and other more or less ideal conditions for wound healing impossible to obtain.

Many measures were undertaken in an attempt to control this air contamination, with only partial success until we began killing the bacteria in the air and on the sterile field with ultraviolet radiation. Some of the more important of these were as follows:

1. The ventilating system without recirculation of air was run continuously during operations, thus supplying the operating room with washed and filtered air free of pathogenic bacteria in an attempt to displace or dilute the contaminated air.

2. No visitors were allowed, and the personnel was kept to the minimum.

3. Masks were worn at all times regardless of whether or not an operation was in progress, and double masks were worn during large clean operations.

4. Talking was reduced to the minimum.

5. Powder for gloves was discontinued to avoid this source of dust.

6. The rooms were painted frequently and washed daily, and the floors were mopped with an antiseptic after each operation.

7. Large clean operations were performed only as the first operation in the morning after the room had been unoccupied for fifteen to twenty hours.

8. An attempt was made to eliminate all carriers of yellow staphylococci from the operating rooms for large clean operations, but this was not practical because of the transient character of the nose and throat contamination in many cases. However, all persistent

carriers of the hemolytic *Staphylococcus aureus* were eliminated.

9. Large clean wounds were thoroughly washed out and irrigated with large amounts of sterile physiologic solution of sodium chloride but without removing enough of the contaminating bacteria to avoid suppuration in all cases.

10. Chemotherapy in the form of methylosaniline to inhibit the growth of gram-positive cocci was tried but without evident improvement in our results.

11. Finally, in desperation we refused to perform certain large clean operations such as thoracoplasties except during the warmer months when the air contamination was persistently low.

12. Plans were under way to try immunization of prospective thoracoplasty patients against the hemolytic *Staphylococcus aureus* but were not carried out because of the satisfactory results obtained with air sterilization.

Since we were convinced that every patient having a large clean operation had many pathogenic bacteria dropping into his wound or onto the sterile supplies that entered the wound and that the matter of infection was determined by the local and general resistance of the patient and the virulence of the organisms, we lost confidence in our "ritual of aseptic technic." As a

TABLE 1.—Reduction in Percentage of Infected Wounds

	Without Radiation		With Radiation
a. Thoracoplasties and radical mastectomies from	32%	to	0.35%
b. Orthopedic operations from.....	17%	to	0.74%
c. Craniotomies and laminectomies from....	9%	to	0.22%
d. Herniorrhaphies from	5.3%	to	0.00%
e. Thyroidectomies from	1.8%	to	0.00%

result of the limitation of certain operations such as extrapleural thoracoplasties to the warmer months, and the replacement of other larger operations with less extensive procedures such as alcohol injections instead of section of the fifth nerve, there was a curtailment in the number of the larger operations performed at a time when the surgical service as a whole was growing rapidly.

After discussing the feasibility of constructing an operating room with all air currents from other parts of the hospital eliminated and with high transmission glass for the walls and roof to let in the sunlight, we turned to artificial sources of ultraviolet radiation to destroy the bacteria in the air of the existing operating rooms as an experiment to prove or disprove our conclusions that the bacteria in the air were our chief source of danger and that the so-called unexplained infections could to a large extent be eliminated by control of this source of contamination. We have never felt that ultraviolet radiation was more than a means of attaining the desired goal of a low air contamination, although there may be some beneficial effect obtained from the direct exposure of the wound which might not be obtained if other means of obtaining a low air contamination are used. At the present time there seems to be no other method of controlling air contamination that is relatively so simple and safe. The cooperation of the Lamp Division of the Westinghouse Electric and Manufacturing Company was secured and it has furnished us with the basic equipment of transformers and radiation tubes, the latter with over 85 per cent of their output at 2,537 angstroms and with a very low ozone production.

7. Hart, Deryl: Sterilization of the Air in the Operating Room by Special Bactericidal Radiant Energy, *J. Thoracic Surg.* 6:45 (Oct.) 1936; Operation Room Infection, *Arch. Surg.* 34:874-896 (May) 1937; Pathogenic Bacteria in the Air of Operating Rooms.²
8. Hart, Deryl: Studies on Effectiveness of the Mask as a Bacterial Filter (unpublished experiments).

The bactericidal effect of this wavelength approaches the maximum that can be obtained with ultraviolet radiation, while the burning effect is relatively low as has been shown by other observers. Radiation of this wavelength is also available in a high degree of purity from a relatively inexpensive source.

After determination by suitable experiments that approximately 30 microwatts per square centimeter of this radiation at the operative site would (1) within less

TABLE 2.—Reduction in Percentage of Patients with Temperature Above 100.4 F. Following Certain Types of Operations

	Without Radiation		With Radiation
a. Thoracoplasties	68%	to	30%
b. Radical mastectomies	46%	to	34%
c. Inguinal herniorrhaphies	36%	to	22%

than three minutes kill over 99 per cent of all the usual pathogenic bacteria sprayed on a Petri dish of blood agar and exposed at this site, (2) not appreciably damage the exposed tissues of an animal during the course of the usual operation and (3) with eighty minutes of exposure cause not more than a transient erythema on the skin of a blond,⁹ we began operating on patients in such a field.

We have since used radiation intensities on the operative wound varying from 18 to 32 microwatts per square centimeter (for a few operations as much as 60 microwatts per square centimeter, but this was given up because of difficulty in protecting the personnel, not from any evident damage to the patient—burning of the skin or tissues, or impairment of wound healing) in over 3,000 cases and have never seen the slightest evidence of damage to the patient in any way. With different installations we have had various intensity distributions throughout the remainder of the operating room. Some of these allowed as many as fifteen to eighteen colonies of sedimenting bacteria in a Petri dish per hour of exposure to survive at the periphery of the room, while others never allowed the survival of more than an average of four colonies per Petri dish in an hour of exposure for six consecutive exposures at any point in the room. With all units the number of surviving colonies of bacteria in a Petri dish per hour of exposure at the operative site varied from zero to four. All intensity distributions have given satisfactory results, with the elimination of wound infection as the criterion. In fact, the results have been so good with the wound infection rate following clean primary incisions where radiation was used (less than 0.25 per cent) that it would be impossible without many thousands of operations to use the infection rate as a criterion as to which intensity distribution is most desirable. We have therefore used as our primary criterion for the best installation the one that will give a very low survival rate of bacteria sedimenting on exposed Petri dishes of blood agar both in the sterile field and throughout the entire room. Our second criterion for

9 While this amount of radiation is apparently safe as far as the patient is concerned, it must be kept in mind that the heads of the personnel are exposed to a higher radiation intensity and that they may be subjected to repeated exposures on the same day. Furthermore, the effect of oft repeated exposures might be more serious than that of a single exposure. Therefore it seems imperative that undue exposure of the personnel should not be permitted. During the five and one-half years of experience with this operative technic we have had no one suffer evident permanent damage and have seen only transient dermatitis, and in the first years a few cases of conjunctivitis which healed promptly. These were caused by the tendency of the staff to take undue liberties with something that they came to consider so harmless.

the most desirable radiation intensity distribution has been the lowest possible intensity of radiation at the site of the wound¹⁰ and on the heads of the personnel compatible with the aforementioned low bacterial survival rate throughout the room.

These conflicting demands on the radiation intensity have been reconciled by an intensity distribution obtained in the following manner:

1. The radiation units except for one beneath the operating spotlight in certain rooms were raised from 7 feet 6 inches to 10 feet 6 inches and spaced so as to irradiate the entire room more effectively. By this means we have been able to:

(a) Obtain a very high intensity in the upper air above the heads of the personnel.

(b) Increase the intensity in all parts of the periphery of the room.

(c) Maintain the same or a diminished intensity on the wound (18 to 30 microwatts per square centimeter).

(d) Greatly reduce the intensity on the heads of the personnel.

(e) Increase the intensity of radiation on the floor where bacteria may sediment.

2. The reserve sterile supplies and instruments were further protected by a high radiation intensity from an auxiliary unit covered with a suitable shield and reflector which limited this high intensity to a field which was only occasionally and transiently entered by the completely covered arm and hand of the nurse. While the intensity used at the operative site is sufficient to kill bacteria sprayed on the surface of a blood agar plate within one to three minutes, the organisms given off by the personnel are swept upward by the convection currents or by the air currents set up by the ventilating system and are subjected to the much higher radiation intensities in upper parts of the room. The organisms which actually come into the field of the reserve supplies or fall on them are again subjected to a radiation intensity much higher than could be tolerated by the wound or by the personnel.

The exposed Petri dish rather than the Wells centrifuge is taken as an index of the efficiency of the radi-

TABLE 3.—Reduction in Percentage of Patients with Temperature Above 99.5 F. for More than Four Days Following Certain Types of Operations

	Without Radiation		With Radiation
a. Thoracoplasties.	78%	to	22%
b. Radical mastectomies	54%	to	21%
c. Inguinal herniorrhaphies	46%	to	14%

ation unit, since it more nearly approaches the conditions existing on the sterile field during an operation, where the bacteria may be killed either in the air or after they fall on the sterile field.

RESULTS OBTAINED

Any attempt to evaluate the results obtained must take into consideration many factors, and it may be difficult to compare one hospital with another unless specific types of operations are considered. Even then differences in operating technic or other local conditions may result in considerable variations in the infection

10 It is fully appreciated that in addition to limiting the bacterial contamination the effect of the radiation on the tissues of the wound itself may beneficially affect wound healing. These criteria do not take into account the amount of wound exposure that would be best for healing. If ever we are able to eliminate bacteria from the wound without exposing it to radiation this problem can then be more satisfactorily approached.

rate. In our own hospital 31 per cent of all the deaths from infections in clean wounds during a period of eleven years occurred within three consecutive months and at a time when the service was only 43 per cent of its present size. Furthermore, in any hospital reporting an infection rate of any given percentage an analysis will show wide variations; if this is broken down into the infection rate for various types of operations, such as thoracoplasties, mastectomies, arthroplasties, craniotomies, herniorrhaphies or thyroidectomies, certain types of operations will show almost no infections and others a rate several times as high as the average. However, in a given hospital with a relatively constant operating personnel, with the exception of changing residents, each of whom has received a similar type of training, improvements in results, with every individual type of operation, beginning simultaneously with the institution of air sterilization and maintained for five and one-half years should be significant. This is all the more so when it is considered that for the preceding five and one-half years the recurring infections persisted despite every effort to control them, with a resultant impairment in the confidence of the staff in "aseptic technic" and a voluntary curtailment in the number of operations performed as a result of the fear of infection. The introduction of air sterilization by ultraviolet radiation in different services at different times caused in each an immediate reduction in the infection rate to from one-twentieth to one one-hundredth of the previous level. By this means the confidence of the staff in the "aseptic technic" has been so largely restored that it now feels that an infection in a "clean wound" is almost the last complication to be expected. As one member expressed it, "The assurance with which one can inspect the temperature chart or the wound without fear of signs of a wound infection far more than compensates for any inconvenience caused by the necessary precautions taken for one's personal protection against the ultraviolet radiation during the operation." These results have now been uniformly good for a consecutive period of five years and eight months since ultraviolet radiation was first used for operations on patients.

The improvements in results in consecutive groups of clean wounds of different types brought about by air sterilization may be presented as follows:

1. A reduction in the percentage of infected wounds.¹ (table 1).

2. A reduction in the percentage of patients having a temperature elevation above 38 C. (100.4 F.) following certain types of operation,⁵ as in table 2.

3. A reduction in the percentage of patients having a temperature elevation above 37.5 C. (99.5 F.) for more than four days following certain types of operations,⁵ as in table 3.

4. General improvement in wound healing and diminished systemic reaction in patients having all types of operations after the introduction of radiation.

5. The elimination of deaths from infection in clean wounds. There were nineteen deaths¹¹ from infected wounds in a group of 1,782 large clean operations in which radiation was not used and no death from infection in a consecutive group of over 2,600 similar operations in which radiation was used.¹

11. Over a period of eleven years and out of a total of almost fifty thousand operations of all types, these nineteen are the only deaths from "unexplained infections" in clean, operative wounds, and they occurred only in special types of large operative procedures, except for 2 debilitated patients each having an exploratory laparotomy, as follows: craniotomy seven, extrapleural thoracoplasty five, orthopedic operations three, exploratory laparotomy two, radical mastectomy one, excision of malignant tumor of the neck one.

CONCLUSIONS

It is felt that the air contaminated by the organisms given off from the noses and throats of the occupants of the operating room today is the greatest breach in so-called aseptic technic and is the cause of the majority of wound infections in well run operating rooms with a relatively good "atraumatic technic."

Ultraviolet radiation (2,537 angstrom units) offers the simplest and most effective means of eliminating this source of danger and in proper intensities can be used without evident danger to the patient or to the well protected personnel.

By this means, over a period of five years and eight months, we have secured improved wound healing, have eliminated deaths from unexplained infections in clean wounds, have reduced unexplained infections to from one-twentieth to one one-hundredth of the previous level and have secured a most gratifying reduction in both the elevation of temperature and the duration of this elevated temperature in patients following operation.

CLINICAL DETECTION OF HEPATIC DISEASE IN HEPATOLENTICULAR DEGENERATION

REPORT OF NINE CASES

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When Wilson¹ described the first cases of progressive lenticular degeneration in 1912 he noted: "the most curious and the most remarkable feature of this familial disease is the constant presence of a profound degree of cirrhosis of the liver. This hepatic cirrhosis does not reveal itself by any symptoms during life; nevertheless it is always found after death." Since then all investigators² have agreed that extensive cirrhosis of the liver is always found at autopsy in the syndrome of hepatolenticular degeneration bearing Wilson's name and that this severe hepatic involvement is a constant, essential and cardinal characteristic of the disease without which the diagnosis cannot be made.

Wilson and Bruce³ and others⁴ expressed the belief, moreover, that hepatic cirrhosis may be the primary disease which actually precedes the lenticular lesions. Reports by Barnes and Hurst⁵ and Jendralski⁶ indicate that hepatitis may kill a patient before lenticular signs or lesions appear and that this hepatic disease may occupy the foreground before there is any suspicion of a pathologic condition of the central nervous system.

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1. Wilson, S. A. K.: Progressive Lenticular Degeneration: A Familial Nervous Disease Associated with Cirrhosis of the Liver, *Brain* 34: 295-509, 1912.

2. Kehr, F.: Zur Aetiologie und Nosologie der Pseudo-klerose Westphal-Wilson, *Ztschr. f. d. ges. Neurol. u. Psychiat.* 120: 488-542, 1930. Wilson and Bruce,³ Barnes and Hurst,⁵ Jendralski,⁶ Lhermitte and Muncie,⁴ Guillaum, Fiesinger, Mollaret and Delay,¹² Lüthy.⁸

3. Wilson, S. A. K., and Bruce, A. N.: *Neurology*, Baltimore, Williams & Wilkins Company, 1940, vol. 2, pp. 806-832.

4. Lhermitte, J., and Muncie, W. S.: Hepatolenticular Degeneration: A Report of Three Unusual Cases, *Arch. Neurol. & Psychiat.* 23: 750-760 (April) 1930. Kehr,² Guillaum, Fiesinger, Mollaret and Delay,¹² Lüthy.⁸

5. Barnes, S., and Hurst, E. W.: Hepato-Lenticular Degeneration, *Brain* 48: 279-333, 1925; 49: 36-60, 1926; 52: 1-5, 1929.

6. Jendralski, F.: Der Fleischersche Ring bei Wilson'scher Krankheit, *Klin. Monatsbl. f. Augenh.* 69: 750-753, 1922.

It is agreed generally that extensive hepatic disease is present before neurologic symptoms manifest themselves.

In spite of the prominent role attributed to the liver in hepatolenticular degeneration, symptomatic evidence of hepatic disease is slight or entirely absent. Occasionally there is a history of jaundice prior to the onset of nervous symptoms, and Jendralski⁶ reported 1 case in which a Kayser-Fleischer ring developed, and death from hepatic cirrhosis and ascites occurred before any nervous symptoms developed. Barnes and Hurst⁵ and others⁷ have emphasized the paucity of clinical symptoms contrasted with the severity of the cirrhosis and stated that no conclusive clinical evidence of hepatic disease has been obtained in most cases until a post-mortem examination was made. The usual tests of hepatic function are particularly disappointing. Lüthy,⁸ Wilson and Bruce³ and Barnes and Hurst⁵ reported that the various tests of hepatic function they had performed were entirely inconclusive in demonstrating hepatic insufficiency in this disease.

The purpose of this report is to show that definite evidence of cirrhosis of the liver in cases of the hepatolenticular degeneration of Wilson can be demonstrated conclusively by the newer tests of hepatic function, particularly Gray's⁹ serum colloidal gold test and the prothrombin as determined by the serial dilution one stage technic.¹⁰ We also call attention to the frequency of hepatolenticular degeneration.

Five of the 9 patients with hepatolenticular degeneration to be reported on were seen for the first time during the past eight months, and the condition of all but 1 had at some time been mistakenly diagnosed as chronic encephalitis. Patients with hepatolenticular degeneration form excellent material on which to ascertain the delicacy of tests of hepatic function, since the clinical features of the lenticular degeneration in typical cases, in particular those in which there is a tremor which becomes grossly exaggerated on voluntary movement, are sufficiently distinctive to permit a diagnosis of the whole syndrome even in the absence of clinical evidence of disease of the liver.¹¹ The characteristic neurologic features of this disease, which is often familial and usually manifests itself before the age of 30, are tremor becoming definitely worse with voluntary movement or excitement; muscular hypertonia; masked facies or a fixed smile; slowed movement; occasionally tonic, clonic or torsion spasms; dysarthria; dysphagia, and at times psychic changes.

It might be contended that with any patient presenting only neurologic symptoms there is no way of knowing that hepatic disease is already present. The following evidence favors the conclusion now generally held that the hepatic cirrhosis always occurs first and that the lenticular lesions follow. In the first place, in numerous cases cirrhosis of the liver has been demonstrated either at operation or on physical examination and only subsequently have nervous symptoms devel-

oped.¹² Secondly, in several families in which one or more members presented the fully developed picture of hepatolenticular degeneration, others had died early in life from hepatic cirrhosis before neurologic symptoms appeared.¹³ In other cases, moreover, there was a definite history of jaundice prior to the onset of any nervous symptoms.¹⁴

Some of the cases show a further characteristic feature, the so-called Kayser-Fleischer ring, a deposition of yellowish brown or greenish brown pigment in Descemet's membrane near the limbus of one or both corneas, which in the presence of signs of extrapyramidal disease is pathognomonic of hepatolenticular degeneration.¹⁵ In the first 4 cases in the report the Kayser-Fleischer ring was seen on inspection with the naked eye, and the localization to Descemet's membrane was confirmed by study with a slit lamp and corneal microscope. No such pigment was seen in the other 5 cases.

In each of the following cases several complete physical, neurologic and routine laboratory examinations were held, the abnormal features of which will be mentioned subsequently. All 9 patients were white males and, unless it is otherwise stated, gave no family history of any nervous or hepatic disorder. There were no symptoms of acute encephalitis or of cirrhosis, and a normal-sized spleen and liver were found on physical examination in all cases unless otherwise noted. The blood counts and hemoglobin content were uniformly normal. Normal cerebrospinal fluid dynamics, cell count, total protein content, Wassermann reaction and colloidal gold curve were noted in 8 of the 9 cases.

REPORT OF CASES

CASE 1.—S. R., a man aged 29, of Russian-Jewish parentage and with 6 siblings, was referred to the University of Chicago Clinics by Dr. Percival Bailey for studies of hepatic function. At the age of 25 he had noticed an involuntary rhythmic forward and backward nodding of his head during excitement. When he was 26 there appeared a flexion-extension tremor on voluntary movement of the left hand and its fingers. Within a few weeks the proximal muscles of the left arm and all those of the right arm became involved in the tremor, which grew worse steadily. Approximately a year and a half after the onset the patient could no longer feed himself because of the wild thrashing of both arms. The tremor had involved both thighs for eight months and the lower jaw for three months. The patient had had difficulty in speech for about one year. Although he usually walked 10 to 30 miles (16 to 48.2 km.) a day he had had one prolonged attack of pronounced generalized weakness during which he could scarcely take a single step. Since childhood both the patient and his brother had had sialorrhea. For six months he had regurgitated a mouthful of liquid after many meals; he had had anorexia for three months, and he had lost 15 pounds (6.8 Kg.) in the past year.

On examination involuntary movement of some part of the body was usually present even when the patient was lying down at rest, although the muscles involved varied from one fraction of a minute to the next. The most striking feature was the gross increase in amplitude of the tremor on any voluntary movement, with a lesser increase on assumption of any position requiring postural tonus. Wild, uncontrollable, flailing excur-

7. Wilson.¹ Wilson and Bruce.³ Lüthy.⁸
8. Lüthy, F.: Ueber die hepato-lenticuläre Degeneration, Deutsche Ztschr. f. Nervenhe. 123: 101-181, 1931.
9. Gray, S. J.: Studies on the Colloidal Gold Curve of Blood Serum in Liver Disease, Proc. Soc. Exper. Biol. & Med. 41: 470-472, 1939; The Colloidal Gold Reaction of Blood Serum in Diseases of the Liver, Arch. Int. Med. 65: 523-544 (March) 1940.
10. Allen, J. G.; Julian, O. C., and Dragstedt, L. R.: Use of Serial Dilutions in Determination of Prothrombin by the One Stage Technic, Arch. Surg. 41: 873-878 (Oct.) 1940.
11. Stern, F.: Epidemische Encephalitis, in Bumke, O., and Foerster, O.: Handbuch der Neurologie, Berlin, Julius Springer, 1936, vol. 13, p. 465. Wilson and Bruce.³

12. Guillaín, G.; Fiessinger, N.; Mollaret, P., and Delay, J.: Sur un syndrome caractérisé par l'apparition d'une encéphalite chronique à prédominance lenticulaire au cours d'une cirrhose hépatosplénique icterigène, Bull. et mém. Soc. méd. d. hôp. de Paris 54: 1798-1810, 1938. Barnes and Hurst.⁵

13. Kehr.² Lhermitte and Muncie.⁴ Barnes and Hurst.⁵ Jendralski.⁶

14. Goldbach, L. J.; Kayser-Fleischer Ring: Wilson's Disease, Am. J. Ophthalm. 21: 1118-1128, 1938. Wilson.¹ Lüthy.⁸
15. Josephy, H.: Degeneratio hepato-lenticularis, in Bumke, O., and Foerster, O.: Handbuch der Neurologie, Berlin, Julius Springer, 1936, vol. 16, p. 839. Hall, H. C.: La dégénérescence hépato-lenticulaire, Paris, Masson & Cie, 1921, p. 153.

sions of the upper limbs appeared on any attempt to use them. In the standing position at rest the arms flapped laterally from the sides and the hands swung in wide movements of flexion and extension at the wrists. Other movements involved in the rhythmic tremor were flexion-extension of the head, protrusion-retraction of the tongue and opening-closing of the jaw. Virtually all possible movements of the body from jerks of the individual fingers and the shoulder girdle to movements of the muscles of the abdominal wall and the hamstrings and quadriceps of both thighs were observed. The frequency of the tremor varied from two to four times per second and made rapid alternating movement of the arms impossible. Weakness in the arms was more pronounced proximally than distally. Tonus in all limbs was normal on the rare occasions when there was no superimposed tremor. The speech combined poor enunciation with emission abnormally irregular in rhythm, pitch and amplitude. A rise to a high pitch and occasional sudden loud syllables or words were characteristic.

CASE 2.—J. S., a man aged 28, of Polish parentage and with 4 siblings, had a tremor of the third and fourth fingers of the left hand of two years' duration. This tremor prevented him from holding an object with those fingers. It spread within a few weeks to the rest of the distal muscles and to the proximal muscles of the left arm and within a few months to the opposite arm. The left leg was involved within six months and the right leg and the head within one year. Dysphagia when the patient was reclining soon appeared, and he had to lift his head even to swallow saliva. Within a few months there were present also sialorrhoea, dysarthria and weakness in the arms and trunk. Early in his illness he noticed that whenever he felt at all cold a severe generalized shivering appeared. This seemed faster and of less amplitude than his tremor. Ever since puberty he had had so much sebum on his face that girls would tell him to wipe his oily face. For several years he had had only one bowel movement a week without a laxative, and at the onset of his disease he complained of frequent belching.

On examination in December 1939 he showed masked facies, infrequent winking, open mouth and a tendency to sustained smile. His tremor showed the same features of frequent variation in amplitude and shift from one group of muscles to another and the same causes and extent of exacerbation as in case 1. He was able to stop the tremor voluntarily for about a minute, at which time tonus on passive movement was normal. The gait was slowed, and the head and shoulders were bent slightly forward; retropulsion was present. On percussion the liver was found to be small; the lower border was 2 cm. above the costal margin. By June 1940 there were noted deficient convergence, with diplopia at less than 1 foot (30.4 cm.), sluggish pupillary reaction to light on both sides, slowed alternating movements of the tongue and a speech defect strikingly similar to that in the previous case. The patient was often unable to void when he wished to but was never incontinent.

When he lay quietly at complete rest the only tremor was an occasional flexion-extension or abduction-adduction movement of any or all of his fingers, but during static or kinetic muscular activity the tremors involved the head, facial muscles, the torso and all limbs. They were usually much worse on the left side, with a rate varying principally between 2 and 4 per second. Although he was afraid his memory was poor, on the Wechsler-Bellevue intelligence test his verbal intelligence quotient was 121, and his intelligence quotient of 102, as shown by performance in the Arthur test, was above the average. Roentgenograms of his skull were normal. Two electroencephalograms showed slow waves mostly in the cerebellar leads, which are compatible with but not diagnostic of degenerative diseases of the central nervous system. There was also an absence of alpha waves or anything faster.

CASE 3.—S. R. was reported on by Bothman and Rolf¹⁶ four years ago. He was 30 years old, of Polish parentage and the younger of 2 siblings. When he was 19 he first noted a rhythmic tapping of the fingers of the left hand when he was sitting quietly, instead of on voluntary motion, as in the previous cases. The tremor spread to the head and all the limbs, and difficulties

in speech appeared, all of the same character and with the same exacerbation on movement as in cases 1 and 2. Although by 1934 there was severe action tremor of his arms on testing or even when walking, he had no tremor when playing football or baseball. Akathisia was present.

On Dec. 22, 1934 there was a tonic spasm in which the legs and arms all became so rigid that he was unable to move them, and his eyes rolled upward so far that he could not see. He was conscious during the two minutes of the spasm. In addition he had several attacks in which his "mind was blank" and he was unable to move his eyes away from an object for three to four minutes. After a pneumoencephalogram in 1934 he was improved for a year, but then progression of the disorder recurred. Dysphagia and urinary incontinence appeared. What were at first thought to be nystagmoid jerks of the eyes could not be correlated with any disturbance of the vestibular apparatus, and caloric and audiometric tests gave normal results. The involuntary movements of the eyes increased in extent, and the eyes tended to turn up when the patient winked. By May 1940 it was apparent that these movements were similar in type to the tremors elsewhere. Although the jerks were always conjugate deviations of both eyes, there was usually no quick component of motion, as in nystagmus, and the amplitude was often grossly irregular from jerk to jerk. Voluntary movements of the eyeballs or any attempt to maintain them in one position, even that of rest, caused a definite increase in the involuntary movements. This was striking on ophthalmologic examination. The tremor also involved facial, masticatory and glossal muscles, lateral rotators and flexor-extensors of the head and practically all the muscles in the arms. The legs showed gross flappings on the attempt at forming the heel to knee position but were quiet at rest. Tonus in all limbs was only slightly increased. Dysidiadokokinesis was present in both arms and legs. During 1940 memory, reasoning and emotional control became severely impaired. Pneumoencephalograms taken after this development showed no change on comparison with the films made in 1934. One hundred and eighty cc. of cerebrospinal fluid was obtained, and the third ventricle was dilated on both occasions.

This is the only patient in the series with any abnormality of the spinal fluid: There were a total protein content of 48 mg. per hundred cubic centimeters and a colloidal gold curve of 0001220000 in October 1934 and a total protein content of 53 mg. per hundred cubic centimeters and a gold curve of 0012321000 in May 1940. In addition to the corneal pigmentation there was an abnormally deep brown color in the exposed portions of the skin of the face, neck and hands. On the dorsum of the hands there was a grayish blue tint superimposed on the brown, particularly in the first intermetacarpal space. A biopsy of this skin was made by Dr. S. W. Becker. The silver stain showed a moderate amount of melanin in the basal layer of the palmar epithelium, with a few dendritic cells indicating a chronic process with little activity. There was almost no pigment in the chromatophores, but a few granules of pigment could be seen throughout the entire thickness of the epidermis, including the stratum corneum. The prussian blue reaction was negative for hemosiderin. Other patients have shown such dermal coloration.¹⁷

CASE 4.—J. S., a youth aged 19, a university student, with 2 siblings, began in January 1940 to complain of polydipsia, excessive salivation, urinary incontinence, dull epigastric pain, insomnia, crying spells at night, easy fatigability and apathy. Only after several months did a full clinical picture of Wilson's disease develop, with masked facies, open mouth, dysphagia, harsh speech in a low monotone, cogwheel rigidity in the right arm and tremor in the left hand which was increased on voluntary movement. His unusual course has been reported in detail by Babcock and Brosin.¹⁸

CASE 5.—N. G., a man aged 23 who had an Italian father and a Serbian mother and had 5 siblings, began to notice a tremor in the proximal part of the left arm when he was 14 years old. Within a few months the tremor involved the left leg also. It began on any attempt to use the left limbs

16. Bothman, L., and Rolf, D. E.: The Kayser-Fleischer Ring in Wilson's Disease and Microcephaly, *Am. J. Ophth.* 19: 26-33, 1936.

17. Lüthy,³ Hall.¹³

18. Babcock, C. G., and Brosin, H. W.: To be published.

and was particularly marked on attempts at fine movements. About three years after the onset, propulsion in the gait appeared. Within another year all movements were abnormally slow, a side to side tremor of the head was present during voluntary movements and oculogyric crises appeared. At first these came on only when the patient was looking upward; later, at any time. The patient could force the eyes downward temporarily, but they would return upward for the duration of the attack, which lasted as long as fifteen minutes. An attack occurred every one to three months. When the patient was 19 the tremor spread to the right arm, and there was one attack of weakness in the legs lasting for four days, during which the patient could hardly walk.

At the first examination, in June 1936, the face was covered with acne and comedos and the hair was coarse and oily. A fixed facial grin was usually present. Ocular convergence was diminished, and the pupillary reaction both on convergence-accommodation and to light was poor. The patient spoke in a monotone, slurring test phrases. At rest there was no tremor at all, but it appeared under the same circumstances as in the first 3 cases. There were dysidiadokokinesis and moderate weakness of the left limbs. He walked with his head and shoulders bent forward, swinging the left arm less than the right. Five separate examiners found complete left hemihypalgnesia. A pneumoencephalogram was normal.

During the next four years the tremor became worse slowly and spread to the right leg. Increased lassitude prevented the patient from doing simple household chores. By May 1940 the lateral rotators of the head and both proximal and distal muscles of all four limbs were involved in the tremor. Slapping movements on performing the finger to nose test on the left side had an amplitude of about 6 inches (15.2 cm.). There was cogwheel rigidity on passive extension of the forearms, hands and left leg and on passive flexion of the left hand and its fingers as well. The tremor and rigidity were much worse on the left side, and the tremor was present in some parts of the left arm even when the patient was at rest. The hypalgnesia had disappeared.

CASE 6.—R. M., a man aged 27 whose grandparents were all German, began in June 1936, at the age of 23, to have uncontrollable jerks of the legs. The movements were at first noticed only when the patient executed critical actions, as in releasing the clutch while driving. These uncontrollable movements gradually progressed, so that by December of that year he was unable to walk, and he has since remained bedridden. In the summer of 1936 the eyes began to jerk whenever he wished to use them for fine work, and difficulty in reading has persisted because of this. In November 1936 the tremor spread to the left arm and his speech became difficult. The utterance of each word was an effort but when successful was likely to be a yell. In November 1936 his intelligence quotient was only 82. The speech difficulty improved, but all other symptoms gradually progressed. An electroencephalogram on Dec. 1, 1938 showed some slow waves of obscure significance.

On examination in June 1940 the patient showed the same type of involuntary ocular movements as were seen in case 3, but they were more severe. In the resting position or on gaze in any direction the motions were vertical, rotary or horizontal. On excitement they approached 90 degrees in amplitude. Convergence was impossible. At rest only a mild pronation-supination tremor of the left forearm and irregular excursions of the left toes and foot were present, but on voluntary movements of the left arm and both legs these limbs jerked in wide arcs. A side to side tremor of the head was present. The abdominal and erector spinae muscles were so rigid that the spine could neither be bent nor be twisted passively or actively, but the tonus in the other muscles was almost normal. The voice was irregularly loud and then low, and of high-pitched, rasping quality. Articulation and rhythm of word utterance were normal. Numerous comedos were present.

CASE 7.—R. W., a boy aged 12, of Russian Jewish parentage and the youngest of 7 siblings, walked at the age of 14 months but did not start talking until the age of 5 years. One year later a tremor began in both arms. About three years after

that a tremor of the head and propulsion appeared, and in another three years the tremor involved both feet. For the first six months of 1940 occasional bouts of epigastric pain, severe enough to make the patient refuse food, and frequent attacks of vomiting after any excitement were noted, presumably due to his cirrhosis.

On examination in June 1940 there were found partial loss of convergence, masklike facies, slurring of polysyllabic words, monotonous speech, lingual dysidiadokokinesis and probable Babinski reflexes in both feet. There was no tremor when the patient lay in bed, but a side to side tremor of the head was seen when it was held up. On the finger to nose test the tremor involved only the pectoralis major and the pronator-supinator muscles of the forearm. A tremor of wide amplitude appeared most strikingly on attempts to write with either hand. The head, shoulder, arm and occasionally the pronator-supinator muscles in the forearm on the corresponding side shook violently. A gross tremor on the toe to examiner's finger test was present in both legs. On the revised Stanford-Binet test the intelligence quotient was only 67. Roentgenograms of the skull and pneumoencephalograms were normal.

CASE 8.—L. W., a man aged 20, of American parentage and with 3 siblings, noted at the age of 17 that individual movements of the fingers of the left hand were difficult, that all fingers wanted to move together and that the left hand tended to fall into flexion. Gradually slowness and awkwardness spread to the proximal muscles of the left arm, but not until two years later did an action tremor of the left hand and its fingers begin. Stiffness of the left leg appeared next. At the age of 20 the muscular fascicles of the left thigh and calf began to jerk occasionally when the patient was at rest. These movements were insufficient to move the limb and were most likely to occur after exercise.

On examination active movements of the left side of the face and of the whole left upper limb appeared slow and weak. During walking the left leg dragged, and the left arm did not swing. There was cogwheel rigidity on passive movement of all joints of the left arm from the elbow down, and on dorsiflexion of the left foot. Lead-pipe rigidity was found at the other joints of the left lower limb and at the left shoulder. With the patient at rest the only involuntary movement was an irregular jerking from side to side of one or the other of the fingers of the left hand. On any voluntary movement of the left arm a tremor appeared, chiefly in the proximal muscles. During conversation there was often a tremor of the mandible or of the muscles around the left corner of the mouth. On strong contraction of both platysmas there was a coarse tremor of the whole left muscle. All tendon reflexes on the left were hyperactive. Roentgenograms of the skull were normal. Although there was no evidence of mental decline in the history or examination, the pneumoencephalogram revealed widened cerebral sulci "probably conclusive of cortical atrophy."

CASE 9.—H. W., seen by us through the courtesy of Dr. Hassin and Dr. Chesrow, was a man aged 32, of American parentage. His father had paranoia and chronic alcoholism. The 7 paternal uncles and aunts in various parts of the country were all healthy, but each had had a child which had had "brain fever" in the first few years of life. Six of the 7 children died, and the seventh was deaf and dumb after her attack. The patient was also said to have had "brain fever," at the age of 6 months.

Between the ages of 1 and 4 years he began to have involuntary movements on action in all four limbs and trunk, did not walk alone until the age of 6 years and then walked as though intoxicated. When he was 11 years old, in 1919, walking became more and more difficult, and by 1932 he was no longer able to walk. The involuntary movements of the upper limbs prevented him from feeding himself except between the ages of 12 and 15 years. His speech, although difficult as long as the patient could remember, had become worse in the past year and had recently become uncontrollably loud and indistinct whenever he was excited. Kyphoscoliosis had been observed since an early age. For seven years there had been intermittent difficulty in urination. Dysphagia had been noted for two years, with food occasionally going up into the nose.

On examination in July 1940 the only involuntary movement the patient showed at rest was an occasional rotation of the right arm, but his resting posture was distorted. The head was tilted to the right. The right hand was placed about 6 inches lateral to the head, the forearm supinated and the hand and fingers flexed. The left arm had no abnormal posture. Both legs were drawn up markedly in flexion at the hip and knee. The legs were inclined to the left and dorsiflexed at each ankle. The toes of the right foot were held in plantar flexion, while the toes of the left foot, especially the second one, were in dorsiflexion. The parts could all be moved actively to normal positions but tended to return to the posture described. Severe kyphoscoliosis of the left lower thoracic and upper lumbar regions and bilateral pes cavus could not be altered by active movements.

On voluntary movement of either arm there were an associated opening of the mouth with elevation of its right corner, torsion of the trunk to exacerbate the scoliosis and extension of the head and extreme flexion of the corresponding forearm and hand with a terminal tremor of the hand and fingers. The execution of the intended act was consequently difficult. On an attempt to grasp an object with the right hand the fingers often hyperextended first. When the hyperextension had been overcome and the object grasped, the hand was then hyperflexed. Heel to knee movements could be executed on each side despite a gross tremor and simultaneous contractions of all muscles in the active thigh and leg. There was severe atrophy and weakness of all four limbs. An increased resistance to passive flexion of the right forearm and extension of the right wrist was seen. The speech impairment was similar to that in case 1. On several tests of memory of recent events the patient was definitely subnormal. An earlier diagnosis had been post-encephalitic dystonia musculorum deformans, but the history of familial cerebral disease is at least as striking as the possibility of encephalitis, and the marked exacerbation of the involuntary movements on action is typical of cases of dystonia musculorum deformans in which hepatolenticular degeneration has been proved at autopsy.¹⁹ Our positive results in tests of hepatic function point to hepatolenticular degeneration.

This series of 9 cases illustrates virtually all the possible neurologic manifestations of the disorder. Among them several unusual clinical features were present. Patients 3 and 6 showed a type of involuntary movement of the eyeballs similar to that seen in the limbs. Attacks of oculogyric crises occurred in case 5 on numerous occasions and in case 3 on one occasion only in conjunction with a generalized tonic spasm. Nystagmus and slow, jerky or paretic movements of the eye all have been mentioned heretofore,⁸ but we have found no previous cases in which involuntary movement of the eyeballs and oculogyric crises have been observed. Likewise absent from other reports has been mention of the attacks of generalized weakness without concomitant muscular spasm which we noted in cases 1 and 5. The absence of a familial history of the same disease in 8 of the 9 cases is unusual also.

In spite of the extensive cirrhosis of the liver which precedes the neurologic symptoms and is always found at autopsy, tests of hepatic function and other studies of hepatic insufficiency have failed, heretofore, to reveal conclusive evidence of pathologic conditions of the liver in hepatolenticular degeneration.²⁰ In an effort to demonstrate this hepatic cirrhosis during life we selected the more recent sensitive tests of hepatic function and investigated additional evidence of disease of the liver by supplementary chemical studies of the blood. The latter included determinations of the plasma bilirubin,

albumin, globulin, cholesterol and cholesterol esters. The studies of hepatic function consisted of those on the galactose tolerance, bromsulphalein retention, five hour dextrose tolerance, hippuric acid excretion, bilirubin excretion, prothrombin time and colloidal gold reaction of the serum.

No evidence of clinical or subclinical jaundice was found in any of the patients with hepatolenticular degeneration. The plasma bilirubin was normal in every case studied except 1 (table 1, case 1), in which a slight increase of the plasma bilirubin above the normal of 1 mg. per hundred cubic centimeters was found. The van den Bergh reaction was normal throughout.

An increase in plasma globulin with a decrease in plasma albumin is associated not infrequently with chronic hepatic disease, particularly with cirrhosis of the liver.²¹ The plasma proteins in our series, however, were normal in all but 2 cases (table 1, cases 3 and 7), in which the plasma globulin was elevated above 2.8 Gm., the upper limit of normal, and the albumin diminished below the normal level of 4 Gm.

Thannhauser and Shaber²² first called attention to the low ratio of the blood cholesterol esters to total cholesterol in hepatic disease. Normally the cholesterol esters constitute at least 40 per cent of the total cholesterol. Jezler and others²³ have confirmed the abnormally low ratio of cholesterol to cholesterol esters in many cases of portal cirrhosis. One of us⁹ has shown that this low ratio is more frequent in the acute parenchymatous diseases than in chronic cirrhosis of the liver. In the 7 cases of hepatolenticular degeneration studied, an abnormal ratio was found in only 2 cases (table 1, cases 4 and 6). In the remaining 5 the ratio was within the lower limits of normal.

Practically all reports have indicated that the galactose tolerance test²⁴ is a useless index of hepatic function in the absence of jaundice.²⁵ Our results are in accord with this concept. The galactose tolerance test gave normal results in the 5 cases in which it was performed.

Although the bromsulphalein test²⁶ has been reported by some investigators²⁷ to yield a high percentage of positive results in cases in which there is clinical evidence of early hepatic cirrhosis, our results with this test were disappointing. Only 2 patients retained

21. Abram, P., and Robert-Wallich, R.: Modifications de sérum sanguin au cours des cirrhoses du foie avec ascite. Inversion du rapport sérum globulines, *Compt. rend. Soc. de biol.* **101**: 291-293, 1929. Salvesen, H. A.: Variations in the Plasma Proteins in Non-Renal Conditions, *Acta med. Scandinav.* **72**: 113-123, 1929. Wiener, H. J., and Wiener, R. E.: Plasma Proteins, *Arch. Int. Med.* **46**: 236-265 (Aug.) 1930. Myers, W. K., and Keffer, C. S.: Relation of Plasma Proteins to Ascites and Edema in Cirrhosis of the Liver, *Arch. Int. Med.* **55**: 349-359 (March) 1935. Foley, E.; Keeton, R. W.; Kendrick, A. B., and Darling, D.: Alterations in Serum Proteins as an Index of Hepatic Failure, *Arch. Int. Med.* **60**: 64-76 (July) 1937.

22. Thannhauser, S. J., and Shaber, H.: Ueber die Beziehungen des gleichgewichtes Cholesterin und Cholesterinester in Blut und Serum zur Leberfunktion, *Klin. Wchnschr.* **5**: 252-253, 1926.

23. Jezler, A.: Cholesterinbestimmungen im Blut als Leberfunktionsprüfung, *Schweiz. med. Wchnschr.* **19**: 108-110, 1938. Epstein, E. Z., and Greenspan, E. B.: Clinical Significance of Cholesterol Partition of Blood Plasma in Hepatic and in Biliary Diseases, *Arch. Int. Med.* **58**: 860-890 (Nov.) 1936. Israel, H. L., and Reinhold, J. G.: Detection of Cirrhosis and Other Diseases of the Liver by Laboratory Tests, *J. Lab. & Clin. Med.* **23**: 588-596, 1938.

24. Shay, H.; Schloss, E. M., and Rodin, I.: II. The Galactose Tolerance Test in the Differential Diagnosis of Jaundice, *Arch. Int. Med.* **47**: 650-659 (April) 1931.

25. Herman, E.: Die Galaktoseprobe bei Leberzirrhose, *Wien Klin. Wchnschr.* **46**: 1230-1231, 1933. Soffer, L. J.: Present Day Status of Liver Function Tests, *Medicine* **14**: 185-254, 1935. Snell, A. M., and Magath, T. B.: The Use and Interpretation of Tests for Liver Function, *J. A. M. A.* **110**: 167-174 (Jan. 15) 1938.

26. O'Leary, P. A.; Green, C. H., and Rowntree, L. G.: Diseases of the Liver: VIII. The Various Types of Syphilis of the Liver with Reference to Tests for Hepatic Function, *Arch. Int. Med.* **41**: 155-193 (Aug.) 1929.

27. Robertson, W. E.; Swalm, W. H., and Konzelmann, F. W.: Functional Capacity of the Liver: Comparative Merits of the Five Most Popular Tests, *J. A. M. A.* **99**: 2071-2077 (Dec. 17) 1932. Bauman, L., and Orr, L.: Bromsulphalein Test Checked with Liver Histology, *New York State J. Med.* **38**: 1161, 1938. Footnote 25.

19. Barkman, A.: Etude clinique sur un cas appartenant au groupe pathologique de la dégénérescence hépatolenticulaire de Hall, *Acta med. Scandinav.* **67**: 236-285, 1927. Jakob, A.: Zur Frage der nosologischen und lokalisationsschen Auffassung der torsionsdystonischen Krankheitserscheinungen, *Deutsche Ztschr. f. Nervenh.* **124**: 148-153, 1932.

20. Wilson and Bruce,³ Barnes and Hurst,² Luth,⁴

10 per cent or more of the dye thirty minutes after an intravenous injection of 5 mg. per kilogram of body weight (table 2, cases 3 and 7). One of these 2 had shown a normal retention of dye five years previously, although he had demonstrated definite nervous symptoms at that time (table 2, case 3).

Von Fejér and Hetényi²⁸ first reported a diabetic-like type of dextrose tolerance curve with hepatic damage. This work has been confirmed for cirrhosis of the liver by Coller and Troost,²⁹ Jacobi³⁰ and Coller and Jackson.³¹ They concluded that hepatic disease produces an abnormal dextrose tolerance curve characterized by a normal or low level of the blood sugar during fasting, a high level of blood sugar during the first or second hour and hypoglycemia during the fourth and fifth hours, the so-called inverted V type of curve.

Definitely abnormal dextrose tolerance curves were found in 4 of our 6 patients (table 2, cases 1, 2, 3 and 4). The level of capillary blood sugar during fasting was normal in every case, but in 4 of the 6 cases there was subsequent hyperglycemia, the sugar content becoming more than 200 mg. per hundred cubic centimeters within two hours, with a return to a normal level within three hours in all but 2 cases (table 2, cases 3 and 4), in which the hyperglycemia persisted. No definite hypoglycemic phase was noted except in 2 cases (table 2, cases 2 and 5), in which the level of capillary blood sugar fell below 60 mg. per hundred cubic centimeters. Two patients in this group did not show the characteristic hyperglycemic phase (table 2, cases 5 and 8), but the dextrose tolerance curves were not entirely normal, because of mild hypoglycemia in one and a somewhat delayed return of the level of capillary blood sugar to normal in the other. The many factors entering into the metabolism of dextrose, including long-standing malnutrition and chronic loss of weight, make this curve a difficult one to interpret. The finding by Robinson and Shelton³² of many diabetic-

The hippuric acid excretion test introduced by Quick³³ in 1933 is considered a reliable test for hepatic cirrhosis.³⁴ Excretion of less than 3 Gm. of benzoic acid in the urine within four hours of the oral administration of 5.9 Gm. of sodium benzoate to patients with normal renal function indicates hepatic disease. We found the reactions to this test positive in 3 of the 7 cases studied (table 2, cases 1, 4 and 8). One patient (table 2, case 7) vomited the sodium benzoate.

TABLE 2.—Tests of Hepatic Function in Hepatolenticular Degeneration

Case	Patient	Dextrose Tolerance, Capillary Blood Sugar, Mg. per 100 Cc.; Hours After Injection							Hippuric Acid Excretion; Gm. of Benzoic Acid Excreted	Bilirubin Excretion; Gm. of Bilirubin Retained	Prothrombin Time, Percent. of Normal	Serum Cholesterol, mg. per 100 cc.
		0	½	1	2	3	4	5				
1	S. R.	92	171	231	261	72	77	93	2.80	12.9	48	532
											46	532
2	J. S.	93	210	182	150	58	..	..	....	2.1	..	532
		93	166	205	135	69	70	80	3.31	10.4	63	532
3	S. R.	103	138	138	240	165	86	70	3.04	6.6	72	522
											70	532
											73	321
4	J. S.	78	142	236	162	160	..	..	2.24	0	65	522
		72	193	246	207	134	..	..	....	...	65	532
5	N. D.	67	166	113	...	57	..	72	3.66	16.2	95	522
		76	186	167	93	68	75	73	....	...	..	521
6	R. M.	..	...	...	...	...	...	...	....	...	..	522
									....	...	..	521
7	R. W.	100	179	181	...	...	...	...	1.03	1.1	65	532
												522
8	L. W.	83	151	174	135	96	69	98	2.70	13.8	48	222
												222
9	H. W.	..	...	...	...	...	...	...	....	...	100	532
												522

The intravenous test³⁵ was resorted to, and the result was normal. Urinary excretion of more than 0.84 Gm. of benzoic acid in one hour is considered normal with this method.

Von Bergmann and Eilbott³⁶ developed the bilirubin excretion test which Harrop and Barron³⁷ and others³⁸ have said is the most delicate single test for impaired hepatic function. Retention of more than 6 per cent of the intravenously injected bilirubin at the end of four hours is considered abnormal. We found this test much more sensitive than any of the previous ones. It gave positive results in 5 of the 8 cases of hepatolenticular degeneration. One patient (table 2, case 2) had a normal excretion of bilirubin when the test was first performed, but after seven months of rapid progression of neurologic symptoms the test gave positive results.

Determination of the prothrombin time has been found by S. J. Wilson³⁹ to be a much more sensitive indication of hepatic damage than either the hippuric acid or bromsulphalein tests and was noted by Allen and Julian⁴⁰ to persist as abnormal in 14 patients with advanced hepatic cirrhosis despite the administration of large doses of a vitamin K-like substance, menadione,

33. Quick, A. J.: The Synthesis of Hippuric Acid: A New Test of Liver Function, *Am. J. M. Sc.* 185: 630-635, 1933.
34. Lindeboom, G. A.: Die Hippursäuresynthese als Leberfunktionsprobe, *Acta med. Scandinav.* 99: 147-161, 1939.
35. Quick, A. J.: Intravenous Modification of the Hippuric Acid Test for Liver Function, *Am. J. Digest. Dis.* 6: 716-717, 1939.
36. von Bergmann, G.: Zur funktionellen Pathologie der Leber insbesondere der Bilirubin-Exkretion, *Klin. Wchnschr.* 6: 776, 1927.
37. Eilbott, G.: Bilirubin-Exkretion bei Lebermittels-Bilirubinbelastung, *Ztschr.* 140: 1927.
38. Harrop, G. A., and Barron, E. S. G.: The Excretion of Intravenously Injected Bilirubin as a Test of Liver Function, *J. Clin. Investigation* 9: 577-587, 1931.
39. Soffer, L. J., and Paulson, M.: Comparative Advantages and Further Modification of Bilirubin Excretion Test for Hepatic Function, *Am. J. M. Sc.* 192: 535-540, 1936.
40. Wilson, S. J.: Quantitative Prothrombin and Hippuric Acid Determinations as Sensitive Reflectors of Liver Damage in Humans, *Proc. Soc. Exper. Biol. & Med.* 41: 559-561, 1939.
41. Allen, J. G., and Julian, O. C.: Clinical Use of a Synthetic Substance Resembling Vitamin K (2-Methyl-1,4-Naphthoquinone), *Arch. Surg.* 40: 912-916 (May) 1940.

TABLE 1.—Studies on Hepatic Function in Hepatolenticular Degeneration

Case	Patient	Plasma Bilirubin, Mg. per 100 Cc.	Plasma Albumin/Globulin, Gm. per 100 Cc.	Plasma Cholesterol/Cholesterol Esters, Mg. per 100 Cc.	Galactose Tolerance	Bromsulphalein Retention
1	S. R.	1.51	4.27/2.58	185/81	1.2	Normal
2	J. S.	0.89 0.79	4.28/2.84	145/56	0.0	Normal
3	S. R.	0.73	3.49/3.01	202/96(1935) (1940)	2.5 1.2	Normal (1935) 10% 1940
4	J. S.	0.63	4.02/2.32	201/75	...	Normal
5	N. D.	0.17	4.82/2.12 4.64/2.17	173/80 179/76	0.53	Normal
6	R. M.	....	4.55/2.48	153/54	...	.....
7	R. W.	0.86	3.90/2.90	163/67	...	100%
8	L. W.	0.85	4.31/1.73	....	0.60	Normal
9	H. W.	....	.....	.....	...	.....

like curves for patients with nervous and mental diseases makes our series particularly difficult to evaluate.

28. von Fejér, A., and Hetényi, G.: Stoffwechselstudien an Leberkranken: I. Mitteilung. Untersuchungen über den Zuckerstoffwechsel der Leberkranken, *Ztschr. f. d. ges. exper. Med.* 42: 670-677, 1924.
29. Coller, F. A., and Troost, F. L.: Glucose Tolerance and Hepatic Damage, *Ann. Surg.* 90: 781-793, 1929.
30. Jacobi, H. G.: Glucose Tolerance as a Diagnostic Aid in Jaundice, *Gynec. & Obst.* 63: 293-297, 1936.
31. Coller, F. A., and Jackson, H. C.: Surgical Aspects of Hypoglycemia Associated with Damage to the Liver, *J. A. M. A.* 112: 128 (Jan. 14) 1939.
32. Robinson, G. W., Jr., and Shelton, P.: Incidence and Interpretation of Diabetic-Like Dextrose Tolerance Curves in Nervous and Mental Patients, *J. A. M. A.* 114: 2279-2283 (June 8) 1940.

indicating that in the presence of a damaged liver prothrombin was not synthesized normally from vitamin K. In 6 of our 8 cases the prothrombin time was abnormal, a higher positive percentage than was obtained with any of the previous methods. Three patients (table 2, cases 1, 3 and 4) received 2 mg. of menadione four times daily for two to six days without exhibiting any change in the prothrombin time, thus providing further evidence that the abnormal prothrombin time was not due to inadequate intake of vitamin K but to the damaged liver. A large series of normal persons and patients with miscellaneous disorders not remotely involving the liver have shown a prothrombin time of 100 per cent.

The serum colloidal gold test of Gray⁹ has given positive results in a higher percentage of cases of clinical cirrhosis of the liver than any other test heretofore reported. Many of these cases of hepatic cirrhosis have been confirmed by autopsy or biopsy. The ease of performance of the test makes the accumulation of an enormous series of control observations possible, over three hundred on normal persons and patients with diseases unassociated with pathologic conditions of the liver. The presence of a normal liver was demonstrated in a large number of these cases at autopsy or biopsy. This series of controls includes patients with numerous miscellaneous neurologic disorders, among which were 6 with paralysis agitans and 4 with parkinsonism following a definite attack of acute epidemic encephalitis. In these disorders the lesions involved the basal ganglions, presumably the same structures affected in hepatolenticular degeneration. In only 1 of the control cases was there an abnormal result, and repetition of this test did not confirm the first positive reaction.

A positive reaction is represented by the flocculation of colloidal gold when serial dilutions of blood serum are added to it, giving a curve (543 or 532) similar to the dementia paralytica curve obtained with spinal fluid. Normally little or no flocculation occurs. The consistently positive results of the serum colloidal gold test in the first cases of hepatolenticular degeneration instigated this study. The test gave positive results on two or more occasions in 8 of the 9 cases. In the 1 case in which the reaction was negative (table 2, case 8), hepatic disease was demonstrated by other methods.

In tables 1 and 2 are summarized the determinations of the blood chemistry and the studies of hepatic function for the 9 cases. Evidence of disease of the liver was found in 8 cases by not less than three different methods, including the presumptive evidence of the abnormal dextrose tolerance test. In 1 case (tables 1 and 2, case 1) six determinations were abnormal: the plasma bilirubin, five hour dextrose tolerance, hippuric acid excretion, bilirubin excretion, prothrombin time and serum colloidal gold reaction. In another case (table 2, case 5), however, only the bilirubin excretion and the serum colloidal gold reaction were abnormal.

Studies of the blood chemistry, galactose tolerance and bromsulphalein retention were of little or no value in detecting hepatic disease, and the hippuric acid test gave positive results in less than half of the cases studied. The tests of the bilirubin excretion and the prothrombin time were found to be reliable indicators of disease of the liver, each giving positive results in all but 2 of the cases studied. The serum colloidal gold reaction appeared to be the most sensitive test for cirrhosis of the liver, demonstrating hepatic disease in 8 of the 9 cases studied.

SUMMARY

1. In 9 cases of hepatolenticular degeneration, illustrating the features of this not infrequent disease, conclusive evidence of hepatic disease was demonstrated by tests of hepatic function for the first time.

2. The serum colloidal gold test of Gray, the prothrombin time and the bilirubin excretion test were found to be more sensitive indicators of hepatic damage in our cases of minimal or no symptomatic evidence of cirrhosis of the liver than the galactose tolerance, bromsulphalein retention or hippuric acid test.

4. Plasma protein levels and the cholesterol, cholesterol ester partition are of little or no value in detecting hepatic disease in cases of hepatolenticular degeneration.

5. The more recent, sensitive methods of detecting hepatic disease may aid in diagnosing hepatolenticular degeneration in cases which have been classified, heretofore, as instances of chronic encephalitis.

Clinical Notes, Suggestions and New Instruments.

OSTEOMYELITIS OTHER THAN OF THE TEMPORAL BONE SECONDARILY AFFECTING THE COCHLEAR AND VESTIBULAR STRUCTURES

REPORT OF THREE CASES

MATTHEW S. ERSNER, M.D., AND JULIUS WINSTON, M.D.

PHILADELPHIA

Extratemporal skeletal osteomyelitis is frequently encountered, and osteomyelitis of the diploic temporal bone furnishes no exception. We are cognizant of the fact that when osteomyelitis occurs in the temporal bone the otic capsule and the vestibular and cochlear portions of the auditory nerve may become directly involved. On the other hand, in general osteomyelitis other than that of the temporal bone the otic capsule and the auditory nerve may become secondarily involved by embolic phenomena or by contiguity or toxic absorption, thus creating the symptom complex of tinnitus, vertigo and deafness. When secondary embolic foci occur in the region of the otic capsule, continuity plays an important role in the causation of these symptoms.

The symptoms vary according to the structures involved, the reaction of the patient to the osteomyelitic infection and the degree of toxic absorption. The incipient symptoms may be transient or permanent and may begin with tinnitus, vestibular disturbance or deafness. For these reasons it is essential, on general principles, to take roentgenograms of the temporal bone during any attack of general osteomyelitis whether it is acute or chronic. This should include the Taylor and Stenver positions in order to ascertain whether any osteomyelitic or other changes have taken place in and about the otic capsule.

Frequent otoscopic examinations should also be made for the purpose of noting any changes in the tympanic membrane.

It might be well to recall that Bezold observed a pink-tinged ear drum in an early stage of otosclerosis during the period of osteomalacia of the otic capsule and that there was a rapid disappearance of this characteristic finding on subsidence of the osteomalacia. One may therefore hypothesize that, by the same token, the same phenomena may be taking place in the otic capsule during general osteomyelitis.

We offer the suggestion of roentgen and repeated otoscopic examinations in general osteomyelitis in the belief that they will reveal early changes which may be of some significance. We are firmly convinced that many more cases will come to light should such a routine be established.

Read before the otology staff of Temple University Hospital in May 1941.
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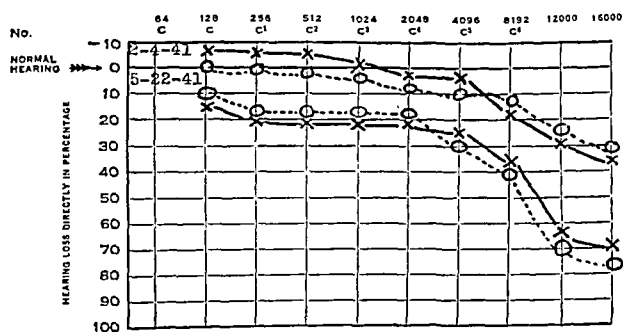
Theissing¹ in a recent publication declares that deafness due to osteomyelitis is a rare disease, only 10 cases having been reported in the literature. However, we feel that this condition is not so rare as we have been led to believe, since we have failed to associate otologic disturbances with general osteomyelitis.

The cases reported in the literature have occurred chiefly in young people. Theissing reports 1 additional case in which there was a generalized staphylococcal osteomyelitis with chief involvement of one thigh. This patient suffered attacks of vertigo, tinnitus and a loss of hearing in both ears.

We wish to present 3 cases of staphylococcal osteomyelitis (without primary involvement of the temporal bone which were complicated by tinnitus, vertigo and deafness.

REPORT OF CASES

CASE 1.—L. M., a youth aged 15, took ill on July 30, 1933 with acute osteomyelitis of the right thigh and was admitted to the Easton Hospital. Shortly after his admission to the hospital he complained of tinnitus and vertigo. On August 10, he was operated on for osteomyelitis of the right thigh. This was followed by several operations up to October 15, at which time he was discharged as improved. On October 30 the patient's family noticed that his hearing was appreciably impaired. Examination of the ears by a local otolaryngologist



Audiometer chart in case 3. To determine the loss of hearing, multiply the average of the readings at 512, 1024 and 2048 by 0.8. Right ear is indicated by O—O and the left by X—X.

was grossly negative except for a considerable hearing loss on both sides. On December 10 he had an acute flare-up of his osteomyelitic process, which necessitated his being readmitted to the Easton Hospital. While being transported to the hospital, the patient experienced considerable pain in his thigh and complained of vertigo. On arrival at the hospital he noticed that his hearing had improved, so much so that all voices seemed "painfully loud" to him. During the next thirty-five days he was operated on several times and was discharged as improved on Jan. 15, 1934. His hearing remained good until April 4, when he suddenly noticed a loss of hearing which became progressively worse over a period of four or five days. He again consulted his local otolaryngologist, who found his ears to be grossly normal but noted that his hearing was practically gone in both ears. On September 7, the patient consulted one of us. Aural examination was grossly negative and his hearing was nil when tested with the tuning forks, voice and audiometer. Neither set of vertical semicircular canals gave any response after three minutes of caloric stimulation with water at 68 F. The horizontal semicircular canals gave very poor response.

CASE 2.—Mrs. S. P., aged 30, was admitted to Temple University Hospital thirteen times between October 1931 and February 1941 for generalized staphylococcal osteomyelitis and recurrent abscesses. She gave a history of the usual childhood diseases, typhoid at 11 years and a tonsillectomy in 1926. In July 1929 an infection of the left buttock developed which was incised and drained. The patient was admitted to the Methodist Hospital, where a diagnosis of

pyemia was made. While in the hospital nephrectomy was performed on the right side. Section of the kidney revealed multiple abscesses. Following this abscesses of the right elbow, both shoulders and the right instep developed. These were opened and drained and the patient convalesced and felt fairly well until the summer of 1930, at which time a right gluteal abscess was opened; a sinus has persisted up to the present time (1941). In October 1931 an abscess developed in the region of the right temporomandibular joint. The patient was admitted to the Temple University Hospital in the orthopedic service of Dr. J. R. Moore for incision and drainage. This was followed by an abscess in the left parotid region which was also incised and drained. The patient was then operated on for the sinus in the left buttock and for osteomyelitis of the right ilium. Subsequently abscesses developed in the left tibia, the left ankle and the left hip, the right knee joint, right side of the forehead, the dorsum of the right hand and in the region of the right mastoid. In October 1932 the patient complained of deafness and tinnitus in the left ear. Her ear drums were somewhat retracted but otherwise normal. Her hearing grew progressively worse and in December 1934 she complained of spells of vertigo in addition to her deafness and tinnitus. At this time she had a 52 per cent hearing loss in the left ear. Her deafness progressed so that on her last admission in February 1941 the patient was found to be stone deaf in the left ear, although she retained normal hearing in the right ear. The right vestibular apparatus gave a fairly good response after forty seconds of stimulation with water at 68 F. The left vertical semicircular canals gave a fairly good response after eighty-five seconds of caloric stimulation, while the horizontal semicircular canal gave no response.

CASE 3.—A. W., a man aged 41, was first seen by us Feb. 4, 1941 giving a history of slight impairment in hearing, tinnitus and vertigo for the past two months, accompanied by nausea, vomiting and staggering.

Gross examination revealed no spontaneous nystagmus. There was no difficulty in past pointing. Aural examination disclosed both ear drums to be normal and both eustachian tubes to be patulous. It was our impression at this time that the patient had a pseudo-Ménière's disease secondary to some focal infection. On February 11 the patient was admitted to the Graduate Hospital for observation and was discharged March 24. The family and past medical histories were insignificant except in the notation that since the age of 16 there has been recurrent osteomyelitis of the right femur. He has had twenty-four operations for this condition and, although tuberculosis was suspected, all tests were negative. He is not addicted to the use of alcohol, smokes in moderation and takes about three cups of coffee a day. About two months prior to his admission to the Graduate Hospital and without any intervening cause or infection a fairly constant fullness of the head suddenly developed. This was made worse by coughing, sneezing, lifting or suddenly changing the position of the head. Occasionally he had spots before his eyes and vertigo, and at times this was accompanied by nausea and vomiting. On less frequent occasions there was staggering, mild tinnitus and deafness. There was no history of any allergic reactions. Prior to admission to the hospital he is said to have had a moderate arterial hypertension, tonsillar tabs and infected sinuses. A few days before entering the hospital he is said to have had a flare-up of the osteomyelitis for which he was operated on February 15 by Dr. M. B. Cooperman, who found a low grade staphylococcal infection with little involvement, and the wound healed rapidly. A complete neurologic examination was first carried out February 17. This was negative except for (1) a widening of the left palpebral fissure with a slight left central facial palsy and (2) hypalgesia of the left cornea. Throughout the patient's residence on his last admission to the hospital his temperature was either normal or slightly subnormal. His pulse was usually 72, although on several occasions it dipped to as low as 60. Only rarely after the encephalogram did it go up to 100. His respirations were normal throughout his stay and his blood pressure was taken at frequent intervals and never exceeded 140 systolic and 90 diastolic. Somatic examinations failed to disclose any diseases of the chest, abdomen or extremities.

1. Theissing, Gerhard: Deafness Due to Osteomyelitis, *Ztschr. Hals-, Nasen- u. Ohrenh.* 45: 284 (Sept.) 1939.

ties other than the healing condition. Detailed studies on the eyes failed to disclose any significant abnormalities. A meticulous study of the throat, the paranasal sinuses and the ears was made and revealed no evidence of any infection in those regions to account for his symptoms. The Bárány test failed to disclose any definite evidence pointing to an intracranial disorder. The blood count and blood chemistry were normal and urinalysis and the Wassermann reaction of the blood were negative. The spinal fluid pressure was 150 mm. of water and a detailed study of the spinal fluid was negative. Roentgen studies were reported as follows: February 14: "Conclusion: Bony sclerosis is noted in the shaft of the right femur, indicating an old osteomyelitis possibly associated with a localized bone destructive process about a fragment of a metal drill at the juncture of the middle and lower thirds of the shaft. No other evidence of osteomyelitis is noted at the present time. Examination of the paranasal sinuses discloses a moderate degree of left maxillary sinusitis and right sphenoiditis. Examination of the mastoid made with particular reference to the petrous pyramids is negative." February 19: "Reexamination of the petrous pyramids by means of Bucky films again demonstrates no evidence of otic pathology." "In the lateral view of the skull, the sella turcica is normal in size and configuration. The pineal gland is only slightly calcified so that it is not definitely visualized in the sagittal views; however, in these views it seems to be in the midline. The skull is otherwise negative. Conclusion: Examination of the skull is essentially negative."

It is to be noted that on February 4 hearing was normal both by air and by bone conduction. On April 26, approximately fourteen weeks after the acute onset, hearing tests disclosed a 16 per cent hearing loss in the right ear and a 14 per cent hearing loss in the left ear by air conduction. Bone conduction was diminished.

COMMENT

Theissing states that osteomyelitic deafness is caused either by an embolism or by a toxic neuritis of the eighth nerve. In case 1 there was a transient deafness. During the early stages it was probably due to a toxic neuritis but as the deafness became permanent it apparently was due to an embolism or some change in the otic capsule. In case 2 deafness was due to a toxic neuritis with a possible embolic phenomena as deafness became lateralized to one side. It is interesting to note that the loss of hearing in both cases was partial at first and later progressed rapidly to complete deafness. In both of these cases, as in Theissing's case, both the vestibular and the cochlear end organs were involved.

In case 3 one may consider the following diagnostic possibilities after due observation: brain abscess, brain tumor, chronic subdural hematoma, aneurysm and toxic headache. There is some definite physical or chemical cause to account for his headaches and associated symptoms. The existence of brain abscess, brain tumor or chronic subdural hematoma, for the time being at least, may be eliminated by the various studies, particularly the pneumoencephalogram. The existence of an aneurysm has not been ruled out and the only possible working diagnosis that we have at this time is a toxic neuritis, a mild tinnitus and a slight impairment in hearing. There is also a decided change in bone conduction. During these fourteen weeks there has been a loss in air and bone conduction with a definite drop in the high frequencies of 4,096 and 8,192. This can readily be ascribed to the osteomyelitis acting as a toxic focal factor.

CONCLUSION

1. Osteomyelitic deafness is probably not as rare as one has been led to believe. We believe that if hearing tests and otologic examinations were performed as a routine in every case of osteomyelitis the incidence of osteomyelitic deafness would be found to be more frequent than has been heretofore recognized.

2. Postmortem studies of the temporal bone would be of value.

3. Bezold's observation may lead to a clue in its relationship to other forms of deafness.

1915 Spruce Street.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

THE MANAGEMENT OF THE CEREBRAL PALSIES

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BALTIMORE

All forms of cerebral palsy are the result of anomaly, injury or disease of the brain, a part of the body of which the functions are so diverse and so difficult to evaluate as to allow for infinite variations of the condition. The functions of the brain are localized in the fully developed person, and brain cells are specialized with a high degree of differentiation. However, there is also an integration of these functions, so that disturbance of any differentiated function results in a necessity for a total reintegration. It is impossible to imagine that any two brains would show identical localization of function. The interrelation between the fundamental inherited automatic functions and the results of the tremendously varied environmental factors could and does bring about differences in total psychomotor behavior, even in identical twins.

All response is motor response. For example, the variations of laughter are so great there are no two persons with laughs enough alike to be confused. Persons can be distinguished by their laughs as easily as by their faces. How a person laughs is to a great extent motor variation, but when he laughs is mainly psychologic. The muscles involved in laughing are not the same in different persons. There are equally definite but less clearly distinguishable variations in all motor function. The gait and the use of the arms in eating or writing are variable.

The results of cerebral palsy are different from the theoretic normal of psychomotor behavior and are of varying degrees of severity. Therefore establishment of a carefully controlled environment as early as possible is advisable to prevent further deviations of response resulting from the impaired function. The impaired function itself produces different environmental experiences and hence still further varies the motor habits and the psychologic behavior.

There is no doubt that a person having cerebral palsy is susceptible to retraining, which may be compared to training the normal person in skills, such as playing the piano. The amount of retraining possible is extremely variable and depends on the degree and the areas of damage to the brain, habit and on innate skill, as well as on the psychologic attitude of the individual patient toward his handicap. It must be remembered that in most cases the condition has existed since birth and that often, since the patient has never known a different state, he is entirely too content with his condition. However, this is not always true.

SELECTION OF CASES

Selection of cases must be made in various ways. Irrespective of the nature or the severity of the motor involvement, the parts of the body involved must be considered. From the standpoint of total motor function, the condition may involve (1) locomotion (the legs, essentially), (2) self help (the arms), (3) speech or (4) general appearance (grimaces, unusual move-

ments of the arms or legs). The aims of treatment must be clearly defined with regard to each of these four fields.

Severity of involvement is not in itself a criterion for or against treatment. One patient may represent a total handicap of motion of the arms and legs and of speech, and although the arms and legs may be so severely handicapped as to be incapable of improvement, nevertheless improvement in speech would be a tremendous asset. Another, with severely handicapped arms and legs, would lead a changed life, even if he could never be taught to walk, by improvement of the use of the arms to the extent of being able to dress, undress and feed himself, get in and out of a wheel chair and wheel it. In cases of milder involvement the problem may be merely one of personal appearance and the elimination of grimaces. The relation of a mild handicap, such as grimacing, to the ability to obtain employment is obvious.

The four fields of involvement are of widely different significance. The elimination of grimaces may convert a dependent person into an economically independent one. The establishment of an independent wheel chair life for a previously bedridden person will free him from the expense of a constant attendant. Walking in some instances is unimportant in relation to other abilities.

COMPLICATING FACTORS IN SELECTION OF CASES

Obviously, patients with definite mental deficiency should not as a rule be treated, and physical improvement in such patients would not be of much value. Naturally there are exceptions. The importance of the four fields is sometimes reversed. When defective persons grow older and become heavier, walking may be their most important attainment. Self help for eating and dressing is of value, but greater ability in the arms often is not possible because of the mental level. Absence of speech can be on a mental rather than a physical basis, as can also bizarre appearance.

Progressive types of cerebral involvement such as are seen in certain forms of encephalitis would contraindicate any but symptomatic treatment. Epilepsy, with its gradual associated deterioration, would also prevent the attainment of any lasting benefit. The vast majority of patients, however, are free from these adverse factors. It is sometimes extremely difficult to distinguish actual impairment of mentality from retardation resulting from the handicap. It is better to give all patients the benefit of the doubt and attempt treatment until it is proved impossible than to decide a priori on the basis of a mental test. The Stanford-Binet examination may give a low intelligence quotient, and, if so, it must be determined subsequently why the quotient is low. It is unwise in general to modify the test, since this will introduce variables which will destroy its accuracy. All response is motor response, and the tests are always affected by motor impairment; psychologists are seldom sufficiently acquainted with motor impairment to balance out the factors responsible for the inaccurate results.

CLASSIFICATION TO DETERMINE METHODS OF TREATMENT

The scope of cerebral palsy includes all the variations of normal coordinated voluntary muscular contraction.

Flaccid paralysis, it is now known, can occasionally result from causes referable to the brain as well as to the spine or to the lower motor neurons. Flaccidity or complete lack of muscular response to stimulation is easily understood. The exact opposite is rigidity (mus-

cular), or a constant state of contraction. This is not frequently seen but must be distinguished (for purposes of treatment) from spasticity, with which it is often confused. The truly spastic muscle is not rigid but is simply hyperirritable and hypercontractile when stimulated. Thus spasticity is present only when the muscle is stimulated. It is an abnormality of response and not a constant condition. The most common stimulus a muscle receives, aside from voluntary stimulation by its nerve, is the stretch it undergoes when its antagonist is voluntarily contracted and motion is produced in the joint in the opposite direction. When this occurs in the normal person, the muscle relaxes, according to the reciprocal innervation theory of Sherrington, or at least it remains idle. The spastic muscle, however, neither relaxes nor remains idle but contracts and more or less effectively blocks the attempted motion. That this is a reflex is obvious, since the same phenomenon occurs as a result of passive as well as of active motion. The most accurate method of determining the presence of true spasticity is by testing for the reflex contraction resulting from stretching. The knee jerk is hyperactive in spasticity but may falsely appear hyperactive in other conditions to be described and hence is not a reliable criterion.

Another abnormality of motor function is involuntary motion. This may not always be neurogenic, since there is reason to believe that in some conditions (the true dystonias) it has its origin in the muscle itself. However, it is usually a manifestation of cerebral disturbance. Involuntary motion differs from spasticity, since it is not the result of attempts to move. The force of contraction and the resultant amplitude of motion are determined by the degree of tension. This, in turn, is the result of emotional states, such as fear, in which it is definitely increased. In sleep it almost disappears.

Involuntary motion may be seen in several forms. The nonintention tremor is a regular reciprocation between antagonists or between one muscle and gravity as an antagonist. Athetosis is the least understood but most common type of involuntary motion. Recent studies have shown that it is independent of any individual muscle but represents rather an irregularly repeated movement of the total joint. Thus an involuntary motion, or athetosis, of wrist flexion will persist with the flexors of the fingers, even after the flexors of the wrist have been cut, when it had previously been shown that the impulse to flex was definitely in the wrist flexors. That this is true has been proved repeatedly and is of great importance in relation to surgical intervention in the treatment of athetosis.

Athetosis is usually but not always accompanied by definite tension, which, although it appears to be of voluntary origin, has become habitual and apparently develops in an attempt to block the athetosis. The tension has persisted so long that it is impossible for the patient to release it except under careful and often prolonged training. It is sometimes confusing, since it may produce a scissors position of the legs and other distortions of motion suggesting spasticity. In fact, the reflexes may often be hyperactive, inconsistently, however. The response is due to automatic reinforcement by strong athetoid contractions or by tension elsewhere in the body. This effect is analogous to the reinforcement test commonly used to emphasize sluggish responses. A careful motor examination is necessary to distinguish tension athetosis from spasticity, and the distinction is important, since methods of treatment of the two conditions differ widely.

Still another motor deviation is primary incoordination or ataxia. Naturally, incoordination will result from almost any motor disturbance, but it is then a secondary condition. Primary incoordination is a disturbance of the proper innervation or control of force or selectivity of muscular contraction. In this condition, as in spasticity, the motor system is normal when not stimulated. Furthermore, the muscles seem normal to passive tests. It is only when motion is willed that the direction and force of the movements are uncontrolled.

Ataxia constitutes the most prevalent form of primary incoordination, and the fundamental difficulty is a disturbance of the balance mechanism and the postural sense. The condition represents the third large division of cerebral palsy, and while statistically there are fewer cases of ataxia than there are of either spasticity or athetosis it is a fairly common form and is relatively easy to distinguish.

METHODS OF TREATMENT

By far the most important therapeutic agents now known to be effective for the cerebral palsies are motor reeducation and relaxation. Surgical intervention and medication are at present adjuncts and aids to treatment. Because repair, except by scar tissue, of damaged nerve tissue, especially in the brain, is slow or absent, restoration of function cannot take place. The improvement attained, therefore, is probably due to substitution, that is, training of uninjured parts of the brain to take over the function of the injured or destroyed areas. This is a highly theoretical assertion. When the normal person is taught unusual types of skills, such as playing the piano or tightrope walking, he trains various coordinated mechanisms involving unusual reciprocal control and balance, which he gradually improves and perfects. Eventually they become automatic, so that the technic of performance is no longer a detailed conscious act. It can be shown that in the same way the usually instinctive automatic acts, such as the reciprocal action of the legs in walking, can be taught to a patient who through injury to the brain at birth has never acquired it. Just what takes place in the brain under these circumstances is not known.

The chief fundamental motions, which may be instinctive, or at least learned early in babyhood, are reciprocal kicking (a fundamental to walking), reaching and grasping (a fundamental to self help with the arms) and vocalized breathing (crying, fundamental to speech). If any of these are interfered with by abnormalities of the neuromotor system, the more complicated activities dependent on them will not be developed. After they have been taught, however, further activities may progress.

It is possible that some form of medication may be found which will restore these automatic functions when they have been learned and are later masked, as in cases of encephalitis or other conditions acquired after babyhood, but it is obvious that if they have never been developed or learned there can be no short cut. Motor training in reciprocity, reaching and grasping, and vocalization, as examples, must therefore be depended on in all cases when these have been shown to be undeveloped.

Relaxation is a second motor ability which must be taught. This is important mainly in cases of athetosis and other forms of involuntary motion. It is continued by teaching motion from the relaxed position. In spasticity and ataxia, on the other hand, relaxation itself

is not as important as motion from the relaxed position, since in these conditions nothing goes wrong until motion starts. In athetosis, the force and amplitude of the motions will be greatly decreased by intensive voluntary relaxation, because they are abolished during sleep and increased during excitement. In tension-athetosis, relaxation is especially necessary to eliminate the habitual tension, developed, as has been explained, in the vain hope that it will stop the involuntary motions. When relaxation has been sufficiently learned, which may take months or even years, then motion from the relaxed position may follow, but it may be started relatively early in cases of spasticity. It consists of training in the maintenance of relaxation of all parts of the body not essential to the specific motion undertaken.

There are many ways of producing relaxation, such as the use of antispasmodics, sedatives, alcohol and hot baths, but all have little value, since they are not voluntary and are transient in their effects. Unquestionably, the person with athetosis can do more while under their influence, and they serve occasionally as useful aids in teaching true voluntary relaxation. However, after the effect of the drug wears off a swing to greater tension usually occurs because of the lack of the relaxing effect. Motion from the relaxed position can be well demonstrated by the use of drugs but does not help much in training, because greater effort, rather than less, must be put into the muscles to be contracted, owing to their relaxed condition. For the spastic patient, use of antispasmodics may well have a place in the reduction of the stretch reflex, but it would be necessary to maintain administration of the drug in order to maintain its effect. At present, because of toxic effects, this would not be practicable. Intensive training in reciprocity while the patient is under the influence of the drug might bring about some carry-over, provided it could be used regularly. This point can be determined only by a longer period of study and a greater volume of material.

Obviously, neither relaxation nor motion from the relaxed position is of any value for patients with ataxia, since they do not exhibit tension, spasticity or involuntary motion. For them the emphasis is on training in balance and coordination. Balance can be improved greatly by teaching the patient an awareness of small deviations of balance. At first this must be a definitely conscious activity, but by practice it gradually becomes automatic. It represents another example of substitution, the development of a skilled conscious act to replace a normally automatic one.

Reeducation in motor fundamentals, relaxation, motion from the relaxed position and training in balance are, therefore, the physical measures essential to the amelioration of the various types of cerebral palsy. The techniques by which they are taught are in the provinces of physical education and physical and occupational therapy.

For persons showing spasticity a careful examination of the muscles, with muscle charts such as are used for poliomyelitis, is necessary. The treatment of weak or flaccid muscles by protection and rest, with carefully graded exercise, must be carefully undertaken. The prevention of unwanted stretch reflexes must be considered in connection with all apparatus and activities. All exercises must bring into play only the desired muscles.

To patients showing athetoid movements, training in coordination and balance as well as in individual

motions alone must be given, since they lack this practice. A chart of the athetoid movements, rather than of muscles, is used as a guide to therapy. In the treatment of all the types, familiarity on the part of the technicians with the various methods of relaxation therapy and training in balance is essential.

SURGICAL INTERVENTION

Except for true contractures, surgical measures have their chief place only in the treatment of spasticity. Since athetosis appears to be independent of individual muscles and since forceful prevention of athetoid motions seems only to intensify the involuntary motion, surgical intervention does not help. As has been stated, athetosis is characterized by an attempt on the part of the body to assume a given position. This attempt is not constant but irregularly intermittent. An example is a case in which the foot was pulled into a varus and in-toeing position by an athetosis of the tibial muscles. A tarsal stabilization was performed, after which an inward rotation (intermittent) of the whole leg from the hip began to develop to bring the foot again into the in-toeing position. Before the operation, the external rotators of the hip had been the more active. Thus, even bony fixations will usually bring about only a shift in the athetosis to other muscles and even other parts of the body. For persons with ataxia there is no particular indication for any operation known at present.

In cases of spasticity, however, good results can be accomplished, but the operation must be undertaken only if it can be followed by efficient postoperative reeducation. The procedures to be carried out must be dependent on the examination of the muscles. Toe walking, so commonly seen with spasticity, may result from a variety of imbalances involving the heel cord muscles and their antagonists, the dorsiflexors. Toe walking is not always the result of spasticity of the heel cord muscles. The possibilities in any case of spasticity are as follows:¹

1. Spastic heel cord muscles vs. spastic dorsiflexors.
2. Spastic heel cord muscles vs. normal dorsiflexors.
3. Spastic heel cord muscles vs. flaccid dorsiflexors.
4. Normal heel cord muscles vs. flaccid dorsiflexors.
5. Flaccid heel cord muscles vs. flaccid dorsiflexors.

The first example will result in toe walking of slight degree only because of the greater strength of the heel cord muscles, the result being due to the constant stretch reflexes produced by walking. The second example will cause more pronounced toe walking, while the third will result in an extreme degree. The fourth will also cause rather pronounced toe walking and will result in a contracture such as is seen in poliomyelitis. The fifth will result in a simple contracture due to gravity.

It is obviously true that the operation advisable would vary with each of the aforementioned imbalances. The recommendations would be as follows:

1. No open surgical intervention, since lengthening the heel cord or even partial neurectomy would result in heel walking and fixed pes calcaneus. Stretching, with the patient under anesthesia, and the maintenance of position by a brace until growth has been attained will give the best results.
2. Partial neurectomy and partial lengthening of the heel cord. The nerves to be partially excised are those to the gastrocnemius or to the soleus muscle, whichever proves the more spastic. This can be determined by testing for a stretch reflex with the knee flexed (soleus

muscle) or with the knee extended (gastrocnemius muscle). In the lengthening of the heel cord, the muscle must not be made too long, because of the normal dorsiflexors.

3. Nearly complete neurectomy and free lengthening of the heel cord, since the dorsiflexors are flaccid.

4. No neurectomy but only lengthening of the heel cord and perhaps stabilization.

5. Stabilization of all joints or midtarsal stabilization and posterior bone block.

It can be seen that the same set of possibilities may be present in any pair of antagonists throughout the body of the spastic patient, and the general reasoning brought out in the foregoing example can be followed. This must be carefully worked out in regard to the hip adductors and internal rotators, which are so easily confused in their action in many persons with spasticity.

GENERAL TREATMENT OF THE PATIENT

The treatment so far described represents a *résumé* of the care of the motor handicap, which is often the most obvious difficulty in cerebral palsy. The condition, however, involves many other variations from normal which are not easy to determine accurately first because their localization in the brain is not known and second because the modifications of the motor functions due to the effects of environment and habit on an abnormal motor response cannot be measured. These variations are chiefly in the fields of education and behavior. The modifications imposed on educational programs by a severe motor speech defect are definite; and behavior, because of the necessity for speech substitutes, is obviously unusual. The erroneous interpretation of such behavior as mental deficiency is easy. Retardation due to the handicap is to be carefully distinguished from true impairment of the mental faculties. It is impossible, for example, to determine the limitations in experience which are produced by inability to walk before the age of 6. The child who learns to walk at the age of 16 months has, by the age of 6, come in contact with innumerable articles and has coordinated his knowledge of them, by handling them, with the varying auditory and visual impressions resulting from moving around. Just how much the child who remains in one chair loses in experience is not measurable, but there must be a great difference, which would interfere with normal learning. Similar variations, but of a different variety, result from handicapped use of the arms.

SENSORY HANDICAPS

Impairments of the sensory apparatus are frequent but easily overlooked components of cerebral palsy. Ocular tests may show normal vision, but loss of control of the extraocular muscles, involved in either spasticity or athetosis, may seriously interfere with reading. With the ataxias, nystagmus is common, and this also may be a handicap to reading.

Hearing defects are common, especially with athetosis. These are usually selective impairment for certain ranges of pitch, with normal hearing in other ranges. Thus the ticking of a watch might be heard at a normal distance, but there might be a complete loss at the same time in the higher frequencies, with inability to hear consonants, especially "s," "f" and "th," and the vowel "e" sounds. The speech of others would be partially unintelligible to the patient, and his own speech, since he spoke as he heard, would be equally unintelligible to the listener. This situation may occur alone or be coupled with some athetosis of the tongue, resulting in a double handicap. The elements of such a speech

1. The combinations not listed would not result in toe walking.

defect must be identified and separated so that each part of the difficulty may be treated rationally.

Some spastic patients, notably those with hemiplegia, have a sensory loss in the spastic arm. Motor retraining may be so successful as to bring about practically normal function in all the joints, but still the child will not use the arm. This may be partly due to habit, but loss of sensation, especially for fine differentiation, should be carefully studied, and when it is present, careful eye to hand coordination must be relied on for developing satisfactory use. Care must be observed not to over-train the bad arm at the expense of the normal one, since stuttering has been seen to develop under these circumstances. All exercises given to the bad arm should be duplicated with the normal one, to keep it ahead and continue its leading role.

Educational methods must take into consideration these sensory difficulties, and teaching methods used for all types of handicaps must be combined in various proportions.

ATTAINMENT OF SKILLS

In training patients with cerebral palsy, the normal activities—walking, eating, dressing and speaking—are the ends to be attained primarily. These are the equivalent of the special skills for which the normal person requires teaching. The progress to higher skills follows directly on the attainment of normal activities. Writing, as a skill, may prove difficult in a given instance. If typing proves simpler because of the particular mechanical difficulty, the emphasis should be placed on learning to write a signature only, since this is essential, and the rest of the training should be in typing.

MEASUREMENT OF RESULTS

The results attained in the motor training of patients with cerebral palsy are best measured in functional attainments. Improvement in walking is measured by (1) endurance, i. e. how many steps or how far the child can walk without falling or tiring; (2) speed, i. e. the length of time it takes him to cover a given distance, and (3) appearance of the gait. The last and actually less important factor is not as susceptible to actual measurement. Moving pictures are of some help but have not proved as valuable as they might seem, since there is so great a daily variation in the abilities of the patients.

Improvement in the various fields of use of the arms can be measured in much the same way. 1. Speed of use, i. e. how long it takes the child to write a given number of words, to dress or to eat a certain amount of food. This may have to be broken down into simpler, less total activities in cases of severe involvement and early in treatment. 2. Appearance of use of the arms, e. g. how accurately and smoothly the patient can button a garment or hold a pencil.

In the field of speech the measurements are again in (1) speed, (2) clarity (in relation to speed) and (3) appearance, e. g. absence of grimaces. Accurate charts of these functions should be kept with regard to both time and distances and will be found the best indications of results.

COMMENT

This discussion has been limited to certain phases of the problem of cerebral palsy. It has not included statistical data, etiology, neurologic material (either medical or surgical) or details of treatment methods and apparatus. It has been devoted entirely to the general management of the problem, chiefly from the motor reeducational, surgical and medical points of view.

3038 St. Paul Street.

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING CORRECTION. HOWARD A. CARTER, Secretary.

CORRECTION: SPERTI IRRADIATION LAMP, MODEL HI-41, ACCEPTABLE

Manufacturer: Sperti Electric Manufacturing Corporation, Beech and Kenilworth avenues, Cincinnati.

The Council report on the Sperti Irradiation Lamp, Model HI-41, which appeared in THE JOURNAL, July 5, 1941, contained an error in the tabulated data dealing with the radiation characteristics. Following are the correct radiation measurements for the Sperti Irradiation Lamp, Model HI-41:

Operated at 117 volts. Measurements at 24 inches from center of tube, on axis of reflector.

Spectral Region	Microwatts per Square Centimeter
Total radiation	34,800
Radiation beyond 14,000 angstroms	31,200
Radiation between 5,790 and 14,000 angstroms	950
Radiation between 4,000 and 5,790 angstroms	1,670
Radiation between 3,130 and 4,000 angstroms (including 3,132)	885
Radiation between 2,800 and 3,130 angstroms	125
No measurable radiation below 2,800 angstroms	

Radiation in ultraviolet lines.

Wavelength	Microwatts per Square Centimeter
2,893	17
3,022	101
3,132	262
3,342	49
3,650, 54, 63	574
4,047	264
4,358	413

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING STATEMENT. THEODORE G. KLUMPP, M.D., Secretary.

DESIGNATIONS "STILBESTROL" AND "DIETHYLSTILBESTROL" FOR THE SYNTHETIC ESTROGEN 4:4'-DIHYDROXY-STILBENE AND ITS DIETHYL DERIVATIVE

In their report on the estrogenic activity of certain synthetic compounds (*Nature*, Feb. 5, 1938) Dodds, Goldberg, Lawson and Robinson propose the name stilbestrol for the compound 4:4'-dihydroxystilbene, which they refer to as the mother substance of a series of estrogenic agents. In this report the authors employ the designation diethylstilbestrol for the diethyl derivative of the mother substance just mentioned. In a later report by Dodds, Lawson and Noble, "Biological Effects of the Synthetic Oestrogenic Substance 4:4'-dihydroxy alpha:beta-diethylstilbene" (*Lancet*, June 18, 1938), the name diethylstilbestrol is used exclusively for the diethyl compound. In later publications, however, Dodds and his associates used the term stilbestrol synonymously with diethylstilbestrol as a concession to the general use of the term stilbestrol for 4:4'-dihydroxy-diethylstilbene which had developed (E. C. Dodds, "Stilbestrol," *Practitioner*, March 1939 and "The New Endocrinology," *Lancet*, Oct. 7, 1939).

To promote the use of accurate nomenclature and with the hope of avoiding confusion in the future should other derivatives of the mother substance come into use, the Council recognized the name stilbestrol (pronounced stīl-bĕst-rōl) as the common, nonproprietary designation for 4:4'-dihydroxystilbene, and the name diethylstilbestrol (pronounced dī-ĕthĭl-stīl-bĕst-rōl) as the common nonproprietary designation for the diethyl derivative, 4:4'-dihydroxy alpha:beta-diethylstilbene, and authorized publication of the foregoing statement. It should be noted that the parent substance, stilbestrol, has relatively slight estrogenic activity. The substance called stilbestrol in a number of recent reports in the American and English literature would be more appropriately referred to as diethylstilbestrol.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 8, 1941

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

One of the most significant actions taken by the House of Delegates at the annual session of the American Medical Association held in Cleveland in June was its approval of a resolution introduced by the Committee on Medical Preparedness urging that the United States government establish an agency for the procurement and assignment of physicians to meet the many needs arising out of the emergency in which the nation finds itself. On Friday October 31 the President of the United States approved an order establishing a Procurement and Assignment Service for Physicians, Dentists and Veterinarians as a part of the Office of Defense, Health and Welfare Services under the direction of Mr. Paul V. McNutt to stimulate voluntary enrolment of these professions. The resolution of the House of Delegates also urged that this agency be under the direction of representatives of the civilian medical profession. The President has appointed as a board to administer the new service the following members: Chairman, Dr. Frank H. Lahey, President of the American Medical Association; Dr. Harold S. Diehl, dean of the medical school of the University of Minnesota and a member of the Education Committee of the Health and Medical Committee; Dr. James E. Paullin, who is retiring president of the American College of Physicians and chairman of the Council on Scientific Assembly of the American Medical Association and also a member of the Committee on Medical Preparedness; Dr. Harvey B. Stone, a member of the House of Delegates of the American Medical Association, of the Committee on Medical Preparedness and of the Council on Medical Education and Hospitals, and Dr. Caleb Willard Camalier Jr., Washington, D. C., a past president of the American Dental Association and a member of its Committee on Medical Preparedness.

The functions of the agency now established include primarily the procurement of personnel from existing

qualified members of the professions concerned. It is proposed that various governmental and other agencies requiring professional personnel for needs related to the emergency shall send their requests to the Procurement and Assignment Service indicating the number of men desired, the time during which they must be secured, and the qualifications and limitations placed on such personnel. The Service may then by appropriate mechanism arrange to secure lists of professional personnel available to meet these requirements, utilizing existing rosters such as the one now available in the headquarters of the American Medical Association and of the American Dental Association, or other public and private rosters which it may consider acceptable. The agency is also authorized to approach such professional personnel as are considered to be available and to use suitable means to stimulate voluntary enrolment. Emphasis should be placed on the fact that voluntary enrolment is desired and that modern means of procurement will be utilized. Already the states and many of the counties of the United States have been organized for military medical preparedness through the Committee on Medical Preparedness of the American Medical Association. Thus it becomes possible to determine availability of various physicians and their qualifications for special services. Obviously it is possible also in this way to protect the civilian needs of American communities.

In its work the Procurement and Assignment Service is authorized to procure an executive secretary who shall serve as executive officer and who is to be a full time appointee with a salary. The members of the board which administers the agency are to serve, as does the Health and Medical Committee, whose organization it parallels, without salary. The board is authorized to secure such necessary assistants as may be required, to establish advisory committees and subcommittees representing the various interests which may be concerned, to develop suitable liaison with governmental and private agencies, to establish suboffices if they are required, and indeed to do almost everything, short of compulsion, that may be useful in supplying the Army, the Navy, the Public Health Service, essential industries and the civilian population with necessary professional personnel.

Under the heading of Medical Preparedness in this issue of THE JOURNAL appears an analysis of the present situation as regards the supply of physicians in the present emergency. Recently THE JOURNAL called attention to the problem created by failure of junior and senior medical students and of interns to avail themselves of the opportunities offered by the Army and Navy medical departments to become enrolled in official agencies which would make them available when called as commissioned medical officers. No doubt the new Procurement and Assignment Service will give

special consideration to this phase of the problem. From the reservoir of young physicians coming into the practice of medicine must be obtained the majority of those needed for replacement of physicians now in service as members of the reserve corps. Should there be a sudden large expansion of our army, the number of physicians needed might approach ten thousand or more. The securing of these men could be brought about without jeopardizing the health of the nation by utilizing the complete cooperation of the medical profession.

SWINE POX AND VACCINIA

Evidence that at least two biologically distinct viruses are involved in the disease currently diagnosed as swine pox is reported by Shope¹ of the Rockefeller Institute in Princeton, N. J. For at least sixty years the relation between the various pocklike conditions of man and domestic animals has been controversial. The majority opinion about twenty years ago was summarized by Gins² of the Robert Koch Institute, Berlin. He found that human smallpox could be adapted to cows, sheep, goats and swine by "lapinization" (serial passage in rabbits), from which he concluded that all pocklike diseases are of common microbic origin. A few veterinarians³ of that time disputed this opinion. They reported, for example, absence of cross immunity between natural swine pox infection and experimental inoculation with vaccinia virus.

Swine pox, prevalent in the United States, is encountered with particular frequency in the Middle Western states. The disease is usually mild and unaccompanied by fatalities, though occasional herd mortalities of from 5 to 30 per cent have been reported. A 2 to 5 per cent aqueous extract of pustular material will reproduce the disease if applied to slightly scarified skin surfaces of normal swine. The incubation period is usually from five to seven days, with papulopustular lesions persisting for six to eight days, after which the lesions become superficially scabbed. Secondary lesions do not occur in louse-free hogs, but numerous secondary pustules may appear in swine infected with lice, especially in the inguinal and axillary regions. Shope found that swine free from lice will not transmit the disease by contact even if confined to the same pen, but contact infection regularly occurs with louse-infected swine after twelve to eighteen days. Lice apparently act merely as mechanized carriers. One attack of swine pox renders hogs solidly resistant to reinfection. The serum of these immune hogs, however, rarely shows demonstrable virus-neutralizing antibodies.

Swine are also naturally susceptible to vaccinia virus⁴ and respond to this virus with vesicular reactions, which

usually are slightly more superficial and slightly more rapid in development than in control inoculation with native swine pox virus. Vaccinia-convalescent hogs are immune to homologous reinfection, and their serums will neutralize homologous virus. Shope found that vaccinia convalescent serum is without demonstrable virucidal effects on native swine pox virus. The antigenic differences suggested by this observation were confirmed by cross inoculation tests. Two groups of hogs were infected experimentally, one with vaccinia virus, the other with native swine pox virus. After complete recovery, each animal was reinoculated simultaneously with the two viruses. Hogs recovered from vaccinia developed typical lesions to native swine pox virus, after the regular incubation period, but failed to develop vaccinia lesions. Conversely, swine convalescent from native swine pox developed typical vaccinia lesions but were refractory to native swine pox. Thus native swine pox and vaccinia virus are biologically unrelated.

The conclusion as to lack of relationship agrees with the minority opinion of earlier investigators but is contrary to the majority opinion. The discrepancy would find a plausible explanation if one was to assume that vaccinia virus at times causes a natural infection in swine. If so, at least two etiologically distinct conditions are currently diagnosed as swine pox, one due to vaccinia virus and the other to the true swine pox virus. From the practical point of view this difference is of little interest, since the control of swine pox would seem to depend largely on adequate control of lice. Whether or not the native American swine pox virus is also infectious for man was not tested in the Princeton laboratory.

TRANSFUSION OF BLOOD AND OF BLOOD SUBSTITUTES

Attempts at blood transfusion during the eighteenth and nineteenth centuries were limited to the use of blood from animals and of defibrinated blood. The operation of blood transfusion does not present great difficulties except for the tendency of the blood to clot. In 1901 Landsteiner discovered the laws of isohemagglutination and isohemolysis of blood; then Jansky, in 1907, established the existence of four distinct blood groups and their compatibilities. The gravest danger of blood transfusion was thus overcome. The next problem was a purely technical one. Methods of blood vessel anastomosis were developed by Carrel and Crile and made possible direct artery to vein transfusion. The direct method required surgical skill and finesse possessed by few. The method was soon displaced by an indirect method of transfusion in which blood from the donor was collected in a vessel coated with a layer of paraffin. Hustin¹ of Belgium proposed in 1914 a

1. Hustin, M.: Principe d'une nouvelle methode de transfusion muqueuse, J. méd. de Bruxelles, 1914, number 32, p. 436

1. Shope, R. E.: Arch. f. ges. Virusforsch. 1: 457, 1940.
2. Gins, H. A.: Ztschr. f. Hyg. u. Infektionskr. 89: 271, 1919.
3. Velu; Rec. méd. vét. 92: 24, 28, 1916. Zahala, J.; Maggio, C., and Rosenbusch, F.: Viruela de los cerdos, Buenos Aires, 1917.
4. Nelson, J. B.: J. Exper. Med. 56: 835 (Dec.) 1932

method of collecting blood in a vessel containing an equal amount of a solution of 5 per cent dextrose in 9 per cent of sodium chloride and sodium citrate in the amount of 20 cc. for each hundred cubic centimeters of blood. The method was used on a rather large scale by the Entente forces during World War I.

Rous and Turner² demonstrated in 1916 that human red cells can be kept alive for four weeks in a mixture of 3 volumes of blood, 2 volumes of 3.8 per cent sodium citrate in water and 5 volumes of 5.4 per cent dextrose. These basic experiments established the feasibility of preserving blood and pointed the way to the development of blood banks. Preservation of blood was studied intensively in Russia. The Moscow Institute for Hematology developed a formula for a diluent solution which included sodium citrate 5 Gm., sodium chloride 7 Gm., potassium chloride 0.2 Gm., magnesium sulfate 0.004 Gm. and distilled water 1,000 cc. Researches by DeGowin, Harris and Plass³ showed that this formula was not more effective in preventing hemolysis than the dextrose-citrate diluent of Rous and Turner. Use of placental blood for massive transfusions was reported from the Oncological Institute of Moscow.⁴ Yudin,⁵ impressed by Shamov's experiments on dogs, began to practice transfusion of blood from cadavers in his clinic at the Sklyafavosky emergency hospital in Moscow. Here the first blood bank was established. Mass application of preserved blood for transfusion was first practiced in Spain during the recent civil war. The Barcelona blood transfusion service, which functioned from August 1936 to January 1939, had obtained 9,000 liters of blood from 28,900 donors. The first blood bank in the United States was apparently that established by Fantus at the Cook County Hospital of Chicago in 1937.

Stored blood, however, was not the final solution of the problem. Progressive hemolysis, which takes place in all stored blood, places a definite limit on its usability. Blood serum and blood plasma have been studied now for some time as possible substitutes for whole blood.

As early as 1901 Brodie pointed out that intravenous injection of blood from serum in experimental animals produced reactions which did not occur when similar quantities of sodium citrate plasma were used. Rossius and later Kallius demonstrated in animal experiments that the effect of blood transfusion in hemorrhage is due not to the oxygen carriers but to the fact that the transfused fluid remains longer within the blood vessels than any other blood substitute. Transfusion of plasma was found to be as effective as the transfusion

of whole blood. Filatov and Kartasevsky⁶ reported on the hemostatic effect of blood plasma transfusion in 72 cases. The blood of the donor was received in a flask half filled with a saline-citrate preservative. The mixture was kept from three to four days in the ice box, and the supernatant plasma was siphoned off and placed in sterile flasks having a capacity of from 50 to 250 cc. These authors found the hemostatic effect of plasma equal to that of whole blood. The plasma may be preserved for months, though the exact limit has not been determined. Plasma from groups A and B may be given any patient without determining his blood group because it does not contain agglutinins. Levinson and Cronheim⁷ demonstrated in animal experiments that the agglutinin neutralizing property of serum is aided by a like property of all the body cells and that this provides a wide margin of safety in protecting the recipient's red cells from the infused agglutinins. Scudder⁸ believes that plasma approaches the ideal physiologic perfusion fluid and is superior to acacia, dextrose, salt and serum. Strumia, Wagner and Monaghan⁹ point out that plasma can be readily prepared and safely transported, can be stored for an indefinite period, is entirely safe and free from reactions, can be used in large and repeated doses, is ready for instant use and does not add to concentration of erythrocytes if this condition is present. They also emphasize that it is not necessary to type the citrated plasma.

Elliott and his associates have also done much pioneer work on blood plasma transfusion in the United States. As early as 1936 Elliott¹⁰ reported a new method of transfusion utilizing a vacuum tube with the aid of which storage of plasma was made possible. Tatum, Elliott and Nessel¹¹ suggest that plasma should be an ideal substitute for whole blood in emergency treatment of shock and hemorrhage from war wounds; it can be prepared where the source of blood is practically inexhaustible and preserved for long periods if necessary before being shipped to the point where it is needed. Transportation will not affect plasma. Laboratory facilities are not required, since typing and cross agglutinating will not be necessary. Florsdorf and Mudd have evolved a method for drying plasma in which the plasma is frozen in solid carbon dioxide and is evaporated under a high vacuum. Edwards, Kay and Davie¹²

6. Filatov, A., and Kartasevsky, N.: Transfusion of Human Blood Serum for Control of Bleeding, *Zentralbl. f. Chir.* 62:441 (Feb. 23) 1935, abstr. J. A. M. A. 104:1461 (April 20) 1935.

7. Levinson, Sidney O., and Cronheim, Anny: Suppression of Isoagglutinins and the Significance of the Phenomenon in Serum Transfusions, J. A. M. A. 114:2097 (May 25) 1940.

8. Scudder, John: Studies in Blood Preservation, *Ann. Surg.* 112:502 (Oct.) 1940.

9. Strumia, M. M.; Wagner, J. A., and Monaghan, J. T.: The Use of Citrated Plasma in the Treatment of Secondary Shock, J. A. M. A. 114:1337 (April 6) 1940.

10. Elliott, John: Blood Plasma, *South Med. & Surg.* 103:252 (May) 1941.

11. Tatum, W. L.; Elliott, J., and Nessel, N.: A Technique for the Preparation of a Substitute for Whole Blood Adaptable for Use During War Conditions, *Mil. Surgeon* 55:481 (Dec.) 1939.

12. Edwards, F. R.; Kay, Jane-, and Davie, T. B.: The Preparation and Use of Dried Plasma for Transfusion, *Brit. M. J.* 1:378 (March 9) 1940.

2. Rous, Peyton, and Turner, J. R.: The Preservation of Living Red Blood Cells in Vitro, I and II, *J. Exper. Med.* 23:219-239 (Feb.) 1916.

3. DeGowin, E. L.; Harris, J. E., and Plass, E. D.: Studies on Preserved Human Blood, J. A. M. A. 114:859 (March 9) 1940.

4. Bruskin, Ya. M., and Farberova, R. S.: Use of Umbilical and Placental Blood for Massive Transfusion in Surgery, *Sovet. vrach. zhur.* 40:1546 (Oct. 30) 1936; abstr. J. A. M. A. 107:2098 (Dec. 19) 1936.

5. Yudin, S. S.: Transfusion of Cadaver Blood, J. A. M. A. 106:997 (March 21) 1936.

describe a cheaper method of preparation of dried plasma by means of vacuum drying. One thousand cc. of plasma gives 8 cc. of dried product. Dried plasma can be reconstituted by solution in distilled water and filtering. The dried plasma promises to be the eventual solution of the problem for war emergency because of the greater stability, smaller bulk and the relative simplicity of packing, storing and transporting.

Current Comment

THE CIVILIAN PHYSICIAN BECOMES AN ARMY OFFICER

A brief comment in the *Lancet* for September 13, in a section in which peripatetic correspondents express their views, calls attention to the great differences that exist between medical practice in civilian life and the type of practice sometimes required in the army. It serves also to emphasize the extent to which modern medical education fails to teach the kind of medical practice that can be used by a general practitioner in many of the circumstances in which he finds himself. The views were prompted by a series of lectures given by army officers and officials to a group composed of consultants, public health officials and a battalion of medical officers.

The hospital officer instructed the hospital staffs to fill in the forms promptly and with due attention; the R. A. M. C. explained to the consultants the inner meaning of the Army's funny little ways; the consulting physicians and a professor of medicine told the regimental medical officers that they must exercise more judiciously their diagnostic powers.

Apparently it was the desire of those who spoke that diagnoses of pulmonary tuberculosis, gastric ulcer and conditions of the heart be made without the use of much of the apparatus and laboratory investigation that accompany such diagnoses in civil life. The point of the description is in a fancied reply made by the writer to the professor of medicine. This reply says, in part:

These Army doctors were the family doctors of yesterday and the medical students of the day before. Some of them may have been Professor X's students. Can it have been that their medical education was faulty? Is it possible that they were taught to regard medicine in the professorial units as an applied science and not as a practical art? Certainly they were taught that the proper investigation of a chronic cough made necessary a radiogram and a sputum investigation; that no chronic dyspepsia could be correctly assessed without chemical and radiological evidence; that cardiac neurosis was established as a diagnosis when electrocardiograms were negative. In short, that neurosis was a negative diagnosis and not to be positively established. Which of us was told by the professors that it was better to miss one case of active tuberculosis or cancer than to confirm five neurotics in their neurosis? When did a professor of medicine come to his conclusions quickly? These R. M. O.'s too were family doctors yesterday. Today they are told by consulting physicians that they send their patients too readily to hospital for investigation. This is apparently true today and it was equally true yesterday; and yet no one has heard a consulting physician tell his family doctor clients that it would be better for their patients if they did not refer them for a second opinion and that some patients

are made worse and not better by investigation. The experienced family doctor knows this; the consulting physician knows it too, but it would require a supernatural disinterestedness in him to preach the good news. Moreover, most family doctors serve in the national health insurance system which denies them the opportunity to investigate their patients at all deeply; so that reference to hospital with consequent loss of clinical experience or treatment of his patient without diagnostic certitude is the panel doctor's daily dilemma. To learn in what circumstances radiology and pathology may safely be discarded in diagnosis requires a clinical experience which can only be acquired by daily contact with them. The professors seem to have made a genuine discovery which will have incalculable effects on medical education. We may again breed a race of family doctors for whom medicine is a practical art; we may one day give the family doctor a medical service in which ample diagnostic facilities are available for him and his patients.

KIDNEY EXTRACTS FOR HYPERTENSION

For several years the experimental and clinical studies on the use of kidney extracts in various types of hypertensive disease have been carefully followed by the medical profession. Conclusive results are not yet available. This is not surprising when one considers the possible variations in technic of preparing the extracts, the various types of hypertensive disease and the difficulty of translating observations on experimental animals into clinical potentialities. Recently Page and his co-workers,¹ using an extract similar to previous extracts but with the lipids removed (thereby decreasing the reactions), have reported a further extensive experimental and clinical study. They demonstrated that arterial blood pressure could be reduced by parenteral administration of kidney extract to dogs and rats with renal hypertension and to patients with essential and malignant hypertension. If administration of the extract is discontinued, however, the blood pressure, after a variable length of time, rises. Furthermore, coincident with the reduction in blood pressure, other objective and subjective signs of improvement have frequently occurred. The authors have encountered two sources of severe reactions to the injection of renal extracts. During the first there is generalized flushing of the skin and lacrimation, the blood pressure falls, dyspnea occurs and retrosternal pain or choking is felt. The patient is pale and perspiring, the extremities are cold and the heart rate is slow. After termination of the reaction, fever lasting several hours occurs. In the second type of reaction the blood pressure and pulse rate rise rather than fall. The patient complains of pain radiating from the site of the injection; spasm of the muscles and flushing and perspiring are observed. Although such reactions, these investigators state, are alarming, permanent after-effects have not been observed. The studies reported by these Indianapolis investigators represent an important addition to knowledge of the subject; nevertheless this form of treatment has not yet passed the experimental stage and its use should be confined to qualified investigators until the indications and technics which are now merely promising have become established and standardized.

1. Page, I. H.; Helmer, O. M.; Kohlstaedt, K. G.; Kempf, G. F.; Gambill, W. D., and Taylor, R. D.: *Ann. Int. Med.* 15: 347 (Sept.) 1941.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

SUPPLY, PROCUREMENT AND ASSIGNMENT OF MEDICAL PERSONNEL

When the 1918 armistice was signed, the United States Army had 3,673,888 men in service and 31,501 Medical Corps officers. Should the United States Army be expanded for any reason in the near future to any similar size, at least an equivalent number of physicians would be required.

Today the United States Army includes approximately 90,000 officers, 6,000 nurses and 1,480,000 enlisted men. Of the 90,000 officers approximately 14,000 are in the medical department, and of the soldiers approximately 109,000 are in the medical department. The officers in the medical department include 11,465 physicians in the Medical Corps, of whom 8,983 are reserve officers, 1,250 regular officers and 1,232 National Guard officers. Calculated on a basis of 6 medical officers per thousand men there is at present a shortage of about 1,473 medical officers. The Army Medical Department also includes 2,300 dentists in the Dental Corps and 660 veterinarians in the Veterinary Corps.

Should the Army not be greatly expanded within the next year but continue with a training program of about the present scope, a maximum of approximately 3,200 replacements would be required each year for the next five years during the period of the Selective Service Act. It is estimated that approximately two thirds of the physicians now in service would elect to remain for the period of the emergency. If, however, it should not be possible to retain these men in service, the number needed for replacement would be considerably expanded.

The Army has a Medical Reserve Corps which includes some physicians who can be called for various types of military service. In calling men to service it is customary to call them from the Reserve Corps. Moreover, there are now organized a considerable number of sponsored units including general hospitals, field hospitals and smaller units. Today the so-called sponsored units include sixty-eight general hospitals, thirty evacuation hospitals and twenty-five surgical hospitals. These units are not yet an active part of the military establishment and the physicians associated with such units, if they are members of the Reserve Corps, may be called into service at any time. Then, if these units are ordered into service, those physicians who are affiliated may be detached from the service to which they are assigned and returned to the sponsored unit.

THE NAVY

The needs of the United States Navy have been satisfied by a considerable expansion of the regular Navy Medical Service. The Navy demands about 6.5 physician for every thousand of their personnel. At present enough physicians are enrolled to meet their needs so that a new increment of approximately 100 physicians is required now as replacements. It seems likely that by July 1942 with the expansion of the Navy another 700 physicians would be required. To meet this need the Navy has a pool of 1,000 in its Reserve Corps.

The Navy also requires from 12 to 15 dentists each year. There are now 650 dentists on active duty, of whom 300 are dental reserves. The Navy has, moreover, approximately 1,500 dentists on reserve status.

THE PUBLIC HEALTH SERVICE

The United States Public Health Service requires about 35 new officers each year to meet its normal requirements for replacements. However, in view of the present expanded activities the next year would require approximately 100 interns in public health service institutions. It also requires about 10 dentists each year in the form of new assignments and for replacements. At present the Public Health Service is recruiting physicians for defense areas, for service in extracantonment

zones and for defense industries. Moreover, state health departments to meet new expansions require about 150 additional physicians.

The United States Public Health Service also maintains a reserve. Most of its men, however, are active in various state or local health positions. The removal of these men from such positions would, of course, require replacement.

THE UNITED STATES VETERANS BUREAU

The United States Veterans Bureau now has about 1,800 physicians in full time positions. About 500 of the physicians in the Veterans Bureau hold positions in the United States Army Medical Reserve Corps, as do also a considerable number of men in the field of public health either with local or with state organizations. In order to bring the Medical Reserve Corps of the Army into a position in which it could be counted as an active asset, all men holding reserve positions who are otherwise occupied in essential functions should resign their commissions from the United States Army Medical Reserve Corps.

THE CIVIL SERVICE COMMISSION

The Civil Service Commission provides many federal agencies with lists of physicians to meet their needs. Such agencies as the Indian Service, the Bureau of Mines, the Coast Guard Service, the Department of Pensions and many other groups employ physicians from the Civil Service lists. Altogether such agencies employ about 2,500 doctors. Each year they employ about 400 new men for replacements or for new positions. For the present fiscal year they lack 250 physicians to meet their requirements.

SUMMARY

An evaluation of the total number of physicians immediately required to meet various governmental needs during the next year would indicate between 2,000 and 3,000 unless there should be a sudden expansion of the United States Army.

PRESENT CONDITIONS

At present even the United States Army Medical Department may have difficulty in securing physicians for its needs.

When the Selective Service age was changed from 35 to 28 the possibility of securing any considerable number of medical men by Selective Service was greatly diminished; indeed, it almost eliminated the Selective Service as a source for securing physicians. The average age of graduation from medical school today is approximately 28 years. Following graduation the young physician must have an internship of at least one year in a recognized hospital. Many of the civilian hospitals of the country are already short of the number of interns that they require to carry on their service efficiently. Many of the large hospitals which employ considerable numbers of interns have established economy by reducing the number by one third to one half for the period of the emergency.

The medical schools of the United States graduate each year approximately 5,000 physicians. The number of physicians graduated is just about what is needed to supply the hospitals capable of extending the education of the young physician by an internship with the interns that they require. Many smaller hospitals having less than one hundred beds, which is the limit placed on an acceptable internship by the Council on Medical Education and Hospitals of the American Medical Association, find it difficult if not impossible to secure interns at this time. Indeed, such hospitals have become accustomed to paying fairly good salaries to young men, who then take a second or a third year of training in the smaller hospitals. By the time the

physician has completed his internship he is in many instances married. The estimates would indicate from one-fourth to one-half the total number as being with dependents by the time they have finished the intern period.

Moreover, among physicians, as among the public generally, in view of the high physical standards maintained by the United States Army and Navy, slightly over one half of the young physicians are able to qualify physically for commissions in the Army or Navy Medical Corps. Indeed, it has been suggested that a different standard be maintained for physicians particularly as relates to minor defects of vision which are correctable with eyeglasses or to some similar defect in order to enable such physicians to be commissioned in the Medical Corps. In many instances these men would be quite capable of giving good medical service without the likelihood that they would eventually become a dependent of the government.

In addition to the demands made on the medical profession by the services already mentioned there is the necessity for some service related to civilian defense, to the Selective Service and to expanded war industries. Thus many of the large construction projects of both the Army and the Navy demand physicians who are being employed as contract physicians and surgeons for the period of construction.

Moreover, in order to provide for a continuous supply of men with specialized training, approximately 800 to 1,000 of the young men who have completed one or two years of internship must take an additional three to five years of residency or specialistic training to qualify before the various boards which examine and certify men in the specialties.

LABORATORY AIDS IN THE DIAGNOSIS OF NEUROTROPIC VIRUS DISEASES

The Office of the Surgeon General, preventive medicine division, has just issued a circular letter on aid in diagnosis of neurotropic virus diseases.

In recent years valuable new laboratory procedures have been developed for the diagnosis and differentiation of certain neurotropic virus diseases. In addition to complement fixation and neutralization tests performed with the patient's blood serum, identification of the virus agent in certain of these diseases may be effected under favorable conditions.

The Virus Laboratory of the Army Medical School, with the collaboration of the Commission on Neurotropic Virus Diseases and the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army will undertake to perform these special diagnostic tests on specimens submitted from the field. It is desired that this diagnostic service be utilized whenever feasible.

The following scheme indicates the special tests which may be employed. In each instance the type of test to be performed will be determined at the Army Medical School on receipt of the specimen and the orienting clinical data.

Disease	Tests on Serum			Tests on Brain and Spinal Cord	
	Complement Fixation	Neutralization	Virus Studies	Virus Studies	Microscopic Examination
Acute aseptic meningitis or lymphocytic choriomeningitis	+	+	+	0	0
St. Louis encephalitis.....	+	+	0	+	+
Lethargic encephalitis (von Economo)	0	0	0	0	+
Herpes simplex encephalitis..	0	+	0	+	+
Rabies encephalitis	0	0	0	+	+
Equine encephalomyelitis....	+	+	0	+	+
* Poliomylitis	0	+	0	+	+
** Postinfectious encephalitis	0	0	0	0	+

* In cases of poliomyelitis, serum specimens should be submitted for these special tests only when doubt exists as to the diagnosis. In all cases of fatal poliomyelitis, specimens of brain and spinal cord should be collected as directed in paragraph 2 b (3) in the circular and forwarded for virus identification and microscopic examination.

** This classification includes mumps meningoencephalitis, postmeasles encephalitis, postinfluenza encephalitis, postvaricella encephalitis, postvaccinal encephalitis and postrabic treatment encephalitis.

Complete details are supplied in the circular (No. 107) on the technic of collecting material for examination.

RED CROSS PLANS ENLARGED FIRST AID PROGRAM

The American Red Cross launched, October 15, an extensive program for training first aid instructors. The courses will consist of forty-five hours of classroom study and practice and will emphasize particularly emergency care of persons affected by war gas, control of bleeding, transportation of the wounded and other first aid problems now being experienced in bombed civilian centers in Europe. The instructors for Civilian Defense groups will be augmented by some thirty thousand instructors who are already active in Red Cross chapters throughout the country. The Red Cross is also expanding its training of first aid instructors for the Army and Navy, the CCC and for municipal police and fire departments. Corps of instructors have already been qualified in thirty Army camps and Navy stations, and these instructors are teaching standard first aid to thousands of service men.

Every instructor impresses on all whom he teaches that first aid never serves as a substitute for professional medical assistance. It is intended only to bridge the gap between the occurrence of an accident and the arrival of a physician.

During the past year more than one hundred and thirty thousand CCC enrollees were taught Red Cross first aid through instructor schools set up on a similar basis. New York is the most recent municipality to make Red Cross first aid required training for firemen. A program has been put into motion there by Fire Commissioner Patrick Walsh to train all of the city's ten thousand firemen who to date have not completed a standard course. Running parallel to these training projects, the Red Cross is expanding Red Cross facilities to train first aid detachments in industry, office buildings, schools and other buildings where large numbers of persons live or work. The project calls for training units large enough to care for casualties in buildings to which they are assigned. In the event of a nearby catastrophe, units from unaffected buildings would be rushed to the scene by a central coordinator.

The Red Cross first aid program is supported from annual dues of members. The organization's annual Roll Call of members begins November 11 and continues through November 30.

ADVANCED FIRST AID FOR CIVILIAN DEFENSE

The U. S. Director of Civilian Defense has urged all communities to spread knowledge of first aid as widely as possible among the people. 'Competent instructors qualified by the American Red Cross are required for training civilian defense workers, employees of industrial plants, business establishments and government bureaus. For this purpose, physicians should register as instructors with the local Red Cross chapter and should employ the "Instructor's Outline" for the standard course (twenty hours), prepared by the American National Red Cross in collaboration with the Medical Division of the Office of Civilian Defense and published by the American Red Cross. On completion of this course, participants will be entitled to receive the First Aid Certificate of the Red Cross and be authorized to wear the appropriate insignia.

The booklet entitled "Advanced First Aid for Civilian Defense," prepared by the American National Red Cross in collaboration with the Medical Division of the Office of Civilian Defense and published by the American Red Cross, is intended for the first aid instruction of the medical and nursing personnel of emergency medical field units and for the training of air raid wardens and members of other enrolled groups of the Citizen's Defense Corps.

Physicians who are members of emergency medical field units should familiarize themselves with the first aid methods outlined in this booklet. They should register in the local Red Cross chapter so that they may serve as instructors to both student and graduate nurses as well as nurses' aides and other non-professional members of their unit and other hospital employees. These five two-hour lessons will not provide nonmedical civilian defense workers with adequate training and experience in the skilful application of first aid procedures. They are intended

to supply minimum instruction which must be followed by repeated drilling under competent supervision

Because of the exacting training requirements for certain enrolled groups of the Citizen's Defense Corps, this ten-hour course, "Advanced First Aid for Civilian Defense," may be interpolated in their instructional curriculum with the understanding that it will be supplemented subsequently by additional first aid training as required for others who have not had previous experience

Copies of "Advanced First Aid for Civilian Defense" are obtainable for free distribution by application to the regional director or regional medical officer in your civilian defense region. For copies of the "Instructor's Outline" (twenty-hour course), applications should be addressed to the local Red Cross chapter

PLAN TO REHABILITATE REGISTRANTS WITH DENTAL DEFECTS

Lieut Comdr C R Wells chief dental officer of the Selective Service System, announced at the convention of the American Dental Association in Houston, Texas, October 29, that the Selective Service System would begin treatment of dentally defective registrants as its first step to carry out President Roosevelt's request for the rehabilitation of registrants having remediable physical defects. About 100,000 registrants rejected for dental defects can thus be made available for military service. Those to be rehabilitated will be called before the local boards and their gross dental defects recorded to determine whether there are any men who would obviously not be accepted for military service. All remaining registrants will be sent to an Army examination station where a thorough dental examination will be made.

In the case of all registrants not accepted without qualification, the Army dental surgeons will state definitely whether the defects can be remedied and the men made fit for general military service. Those found to have remediable defects will return to the local boards, which will authorize the treatment and refer them to dentists in their own community. The cost of the treatment will be borne by the federal government.

Thus the civilian practitioners will rehabilitate the men in their communities. The program will be under the direction of Selective Service through the local board members and the physicians and dentists assigned to the local boards.

MEDICAL REHABILITATION PROGRAM FOR YOUTH

A campaign of medical rehabilitation of youth unfit to serve with the armed forces is being carried on by the NYA health service, it was announced October 20 by Miss Helen M. Harris, National Youth Administrator for New York City and Long Island. More than 18,000 young men and women have been examined in the NYA health centers since the inauguration of the medical program in September 1940 and 50 per cent of these are either now under medical care or have had their medical defects remedied. Since the NYA is not permitted to give remedial treatment, the young people are referred either to their family physician or dentist or to clinics.

Citing the work of the health unit of the Brooklyn Work Center, 980 Atlantic Avenue, Dr. Harold Jacobziner, medical director of the program, explained that since the unit has been opened in the middle of August 1,162 youth workers have received complete physical examinations.

Of the youths examined, Dr. Jacobziner revealed that only 68 were fit for all kinds of work and all types of athletic activity, 520 had easily correctable defects, 372 had minor uncorrectable defects and 202 were definitely limited in their employability by uncorrectable defects. More than 200 of these youths are now under medical care. Of these, 41 per cent are utilizing private medical and dental aid while the remainder are using clinics. At the Brooklyn Center every youth referred for remedial treatment has received an average of two and one half follow-up examinations by NYA physicians.

The local medical societies also are cooperating with the NYA health program.

ARMY CREATES POST OF THE AIR SURGEON

The War Department announced, October 24 the creation of the post of the Air Surgeon, with Col David N W Grant, Medical Corps, as the first officer to be named to the position.

Colonel Grant, as the Air Surgeon, will be a member of the staff of Major General Henry H Arnold, Chief of the Army Air Forces, and will head a service to coordinate the medical activities of the Army Air Forces. Colonel Grant also will retain his post as Chief of the Medical Division, Office of the Chief of the Air Corps.

Colonel Grant entered the Army Medical Corps as a first lieutenant in July 1916. Since 1930 he has been on duty with the Army Air Corps. He received his M D degree from the University of Virginia Department of Medicine, Charlottesville, and is a graduate of the Army Medical School, the School of Aviation Medicine at Randolph Field, the Air Corps Tactical School and the Chemical Warfare School.

LIBRARY SERVICE FOR PATIENTS IN GENERAL HOSPITAL

Library service will be provided for patients at nine general hospitals being constructed by the Army through the establishment of a five thousand volume library at each of the new institutions. About \$57,600 has been allotted for the initial purchase of books. The War Department, through the Army Library Service, will furnish four thousand of the books for each library, and the librarian in charge of each unit will select the remainder of the quota.

Librarians for the hospital libraries will have to meet the same requirements as those serving in other Army libraries. They will be chosen by the corps area commander having jurisdiction over the respective hospitals.

Library service will be inaugurated as soon as the hospital construction is completed. It is expected that all work will be finished within the next month.

Hospitals where the new libraries will be established include.

Barnes General Hospital, Vancouver Barracks, Wash
Billings General Hospital, Fort Benjamin Harrison, Ind
Hoff General Hospital, Santa Barbara, Calif
La Garde General Hospital, New Orleans
Lawson General Hospital, Atlanta, Ga
Lovell General Hospital, Fort Devens, Mass
O'Reilly General Hospital, Springfield, Mo
Stark General Hospital, Charleston, S C
Tilton General Hospital, Fort Dix, N J

MEDICAL ADVISERS TO THE NAVY

Three physicians have been appointed as consultants to the medical department of the U. S. Navy, newspapers reported October 15. They are Drs Frank H. Lahey, Boston, President of the American Medical Association, Donald C. Balfour, director of the Mayo Foundation, Rochester, Minn., and Wilbur A. Sawyer, New York, director of the International Health Division of the Rockefeller Foundation.

GRADUATION AT SCHOOL OF AVIATION MEDICINE

Graduating exercises were held at the School of Aviation Medicine, Randolph Field, Texas, October 15 for a class of flight surgeon assistants. The address was given by the commander of the school, Lieut Col Eugen Reinartz, M C., and the diplomas were presented by Capt R L Fisher, M C.

MONTHLY MEETING OF MEDICAL OFFICERS

Surgeon Gen James C. Magee has announced that monthly meetings of medical department officers residing in and near Washington, D C., will be held at 8 p m at the Army Medical Center on the third Monday of each month from October to May.

ORGANIZATION SECTION

MEDICAL ECONOMIC ABSTRACTS

CARE OF THE MENTALLY ILL

The care of the mentally ill has been most inadequate. Dr. Victor H. Vogel, past assistant surgeon of the United States Public Health Service,¹ begins a discussion of this subject by noting that "the deplorable conditions in many state hospitals for the mentally ill and the huge costs of this type of illness have been recently discussed in several popular magazines and newspapers of wide circulation." The overcrowded condition of such governmental institutions for the care of the mentally sick has been pointed out annually in the reports of the Council on Medical Education and Hospitals of the American Medical Association.

This is the largest section of the field of health care that from its very nature is necessarily confided to governmental agencies. All stages of the detection, commitment and care of the mentally diseased is also a governmental function, and the way in which this function is performed is described by Dr. Vogel as follows:

Archaic, persecutory commitment practices, which include court appearances and sometimes jury trials, help to perpetuate this attitude. In too many states the mentally ill are thrown into jail, after which they are transported to the state hospitals by sheriffs, who frequently substitute handcuffs, chains, and strait jackets for humane, intelligent handling, which could be furnished by the state hospital attendants. Why should a mentally ill patient be handled as a criminal in order to get for him the treatment that he needs?

PHYSICIANS PAY IN BRITISH HEALTH INSURANCE

In the midst of the war, the government of Great Britain decided to increase the coverage under health insurance by raising the income limit from £250 to £420 (at the present rate of exchange from about \$1,000 to \$1,700). This of course greatly decreased the field of private practice by removing those manual workers with sufficient incomes to pay for their medical services. At the same time some two million of the healthiest section of the population were taken into the army. Most of these were formerly under insurance. This meant that the insured are now the least healthy section of the community and require more medical care per person than before this change

took place. The rapid increase in the cost of living also hit the panel physicians especially hard.

Physicians in the British insurance system have always been underpaid. There have been several changes in the capitation fee, but at the beginning of the war it was 9 shillings per annum (less than \$2 a year at present). Although there has been a sort of "gentlemen's agreement" since the introduction of the insurance system by Lloyd George that no change affecting the medical profession would be made in insurance legislation without first consulting the British Medical Association, the government announced the increase of coverage without any such consultation.

The result was almost a universal protest on the part of the physician. The government made an offer of an increase of 6d and, when it was seen that this would not satisfy the physicians, this was raised to 9d (about \$0.15). The physicians looked on this as wholly inadequate, and as a result a special panel conference was held at the headquarters of the British Medical Association.¹ This meeting was decidedly stormy. Speaker after speaker echoed the statements of the first one to discuss the subject that "the capitation fee never had been adequate but whenever the rank and file wished to bring the matter to a head they were always met with the well worn phrase that the time was not opportune." Another physician related that in a previous discussion when an insurance doctor complained that the standards of service could not be maintained with such low rates of pay the medical officer replied "twopence a week is what you are going to get. You must scale your work down to twopence a week, and if you want to do better work you must do it as a hobby." Another physician presented a chart showing that from 1914 to 1941 the work of a panel physician "had increased by 100 per cent, the cost of living by 100 per cent, the fee by only 28 per cent and they were offered 9d."

The conference was finally forced to recognize that it was helpless to accomplish anything and adopted the following motion:

That this Conference, in view of the national emergency now existing, cannot do otherwise than accept the Minister's offer of a capitation fee of 9s 9d, but in doing so wishes to record an emphatic protest against

- (1) The inadequacy of the offer and
- (2) The fact that a new group of insured persons has been admitted to insurance without previous consultation with the profession.

1. Vogel, V. H.: Pub. Health Rep. 56: 1941-1947 (Oct. 3) 1941.

1. Supplement to British Medical Journal, Aug. 16, 1941, pages 21-25.

WOMAN'S AUXILIARY

Arkansas

The Woman's Auxiliary to the Arkansas Medical Society opened its seventeenth annual meeting in Little Rock, April 14, 1941.

The following officers for 1941-1942 were elected: president, Mrs. Calvin A. Churchill, Batesville; president-elect, Mrs. L. G. Fincher, El Dorado; vice presidents, Mrs. C. W. Dixon, Gould, Mrs. Fred Hames, Pine Bluff, Mrs. J. B. Jameson, Camden, and Mrs. H. T. Smith, McGehee; historian, Mrs. C. W. Garrison, Little Rock; publicity secretary, Mrs. Ralph Cross, Texarkana; treasurer, Mrs. Fount Richardson, Fayetteville; parliamentary referee, Mrs. C. H. Lutterloh, Hot Springs.

Iowa

The Thirteenth Annual Convention of the Woman's Auxiliary to the Iowa State Medical Society was held in Davenport, May 14-15, 1941. Membership in the state auxiliary was reported to have increased from 340 to 464. The Gertrude Downing membership cup was awarded to the Polk County auxiliary for having made the greatest percentage of gain in membership during the preceding year. Major A. K. Stiles of

the Rock Island Arsenal gave an address on national defense. Greetings were extended by Dr. Nathan B. Van Etten of New York, then president of the American Medical Association; Dr. Frank P. McNamara of Dubuque, president of the Iowa State Medical Society, and Dr. Earl B. Bush of Ames, president-elect of the Iowa State Medical Society. In a symposium Dr. John H. Randall of Iowa City discussed cancer control and Dr. Donald C. Konzett of Dubuque discussed crippled children and read a paper written by Dr. James A. Downing of Des Moines on "The League for the Hard of Hearing." Officers elected were as follows: president, Mrs. W. R. Hornaday, Des Moines; president-elect, Mrs. F. W. Mulsow, Cedar Rapids; vice presidents, Mrs. J. F. Veltman, Winterset, Mrs. A. H. Hendrickson, Sioux City, Mrs. Isaac Sternhill, Council Bluffs, and Mrs. L. A. Coffin, Farmington; secretary, Mrs. M. J. Moes, Dubuque, and treasurer, Mrs. A. E. Merkel, Des Moines.

New York

The Nassau County auxiliary met in Mineola. Mrs. Robert Oliver, president of the Suffolk County League of Women Voters, spoke on "The Child Guidance Clinic."

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Two Day Course of Postgraduate Instruction.—The committee on postgraduate instruction of the Arkansas Medical Society conducted its tenth two day course of postgraduate instruction at the University of Arkansas School of Medicine, Little Rock, October 22-23. The morning of the first day was devoted to a symposium on the clinical use of the vitamins. Included among the speakers on the general program were:

Dr. Grady W. Reagan, Little Rock, Early Diagnosis of Prostatic Obstruction.

Dr. Merlin J. Kilbury, Little Rock, Fungous Diseases.

Dr. Frederick W. Harris, Little Rock, Cardiac Emergencies.

Drs. Paul L. Mahoney and John S. Agar, Little Rock, Diagnosis and Treatment of Neuralgias of Dental Origin.

Dr. Barton A. Rhinehart, Little Rock, Medical Treatment of Patients with Cancer.

Miss Beatrice Hodnett, Mrs. Norma Gaston and Miss Margaret Paynter, Some Important Features in the Business of the Practice of Medicine: A Presentation of the Doctors' Secretaries Club of Little Rock.

One session was devoted to a discussion of sulfonamide drugs with Drs. John N. Compton, Little Rock, speaking on "Present Status of Sulfonamide Therapy"; Charles Wallis, Little Rock, "Experiences with Sulfaguanadine in Diarrhea and Dysentery," and Carl L. Wilson, Fort Smith, "Sulfapyridine Anuria." A surgical clinic concluded the first day's meeting and a medical clinic the second day's program.

CALIFORNIA

Society News.—The San Francisco County Medical Society devoted its meeting, October 14, to a discussion of "The Sulfa Family—1941" with the following speakers: Drs. Edmund F. Anderson, John W. Brown, Windsor C. Cutting, Arthur Haim, Clark M. Johnson, Carleton Mathewson Jr. and Lowell A. Rantz. All are from San Francisco.—The Los Angeles Society of Neurology and Psychiatry was addressed, October 15, by Drs. Charles Posner, Pasadena, on "Behavior Problems in Children in Relation to Endocrine Dysfunction" and Charles Hunter Shelden, Los Angeles, "Congenital Chiasmal Lesions."

Medal Presented to Dr. Guedel.—Dr. Arthur E. Guedel, Los Angeles, was guest of honor at a dinner, October 21, given by the section on anesthesia of the Los Angeles County Medical Association to mark the presentation to him of the Hickman Medal by the Royal Society of Medicine, London. At the dinner a representative of the British government made the presentation on behalf of the Royal Society of Medicine. The principal address was delivered by Chauncey D. Leake, Ph.D., librarian of the medical school library, professor of pharmacology and lecturer in medical history and bibliography, University of California Medical School, San Francisco.

CONNECTICUT

Twenty-Seven Years a Hospital Superintendent.—Dr. Charles T. LaMoure has retired after twenty-seven years' service as superintendent of the Mansfield State Training School and Hospital, Mansfield Depot. He was succeeded on October 1 by Dr. Neil A. Dayton, Boston, formerly director of statistics and director of mental deficiency in the Massachusetts State Department of Mental Health. Dr. LaMoure graduated at Albany Medical College in 1894. He was superintendent of the Gardner State Colony from 1911 to 1914, when he became superintendent of the Mansfield institution. At one time he was president of the Connecticut Society of Psychiatry. Dr. Dayton graduated at Ohio State University College of Homeopathic Medicine, Columbus, in 1915. He became assistant to the commissioner of the Massachusetts State Department of Mental Diseases in 1926 and in the same year director of the division of mental deficiency. In 1938 he was president of the American Association on Mental Deficiency.

FLORIDA

Clinical Session.—Dr. George G. Oswalt, Mobile, Ala., was chosen president of the Gulf Coast Clinical Society at its sixth annual meeting in Pensacola October 16. Drs. Donald G. Rafferty, Pass Christian, Miss., and Sidney G. Kennedy Jr., Pensacola, were named vice presidents. Dr. Charles L. Ruther-

ford, Mobile, is the secretary. The 1942 session will be held in Mobile. Speakers on the program included Drs. Edgar Burns, New Orleans, on "Treatment of Urinary Infections"; James S. McLester, Birmingham, "Functional Disorders of the Digestive Tract"; Philip S. Hench, Rochester, Minn., "Management of Chronic Arthritis"; Warren T. Vaughan, Richmond, Va., "Allergic Factor in Certain Dermatoses."

IDAHO

Society News.—The Southwestern Idaho Medical Society was recently addressed in Boise by Dr. Frank H. Lahey, Boston, President of the American Medical Association, on "New Advances in Medicine and in Surgery." He also conducted a clinic on diseases of the thyroid gland at St. Luke's Hospital.

Personal.—Dr. Ruth J. Raattama, Springfield, Ill., has been appointed director of maternal and child health and crippled children of the state department of health, according to *Northwest Medicine*.—Dr. Paul R. Ensign, Topeka, Kan., has been named director of the Boise-Ada County health unit, effective next June. Until that time Dr. Gustavus Denton Bock, Boise, will be acting director, according to *Northwest Medicine*.

KENTUCKY

State Medical Election.—Dr. E. Murphy Howard, Harlan, was chosen president-elect of the Kentucky State Medical Association at its annual meeting in Louisville, October 2. Dr. Elmer L. Henderson, Louisville, was inducted into the presidency. Other officers include Drs. Luther Bach, Bellevue; Michael J. Henry, Louisville, and Charles F. Long, Elizabethtown, vice presidents. The 1942 annual convention will be held in Murray.

MASSACHUSETTS

District Meeting.—The first regular meeting of the Norfolk District Medical Society was held at the U. S. Marine Hospital, Brighton, October 28. The speakers included: Sr. Surg. Richey L. Waugh, Boston, "Treatment of Fractures"; P. A. Surg. James F. Spindler, Boston, "Treatment of Gonorrhea"; P. A. Surg. Thomas R. Dawber, Mobile, Ala., "Treatment of Pneumonia," and Surg. Lee C. Watkins, Boston, "Treatment of Injuries of the Eye."

Personal.—Harvard University, Cambridge, announced on October 3 the following appointments to the teaching and research staff, among others: Dr. Norbert A. Wilhelm, superintendent of the Peter Bent Brigham Hospital, Boston, as lecturer on public health practice; Dr. William V. Knoll, pathologist of the Robert B. Green Memorial Hospital, San Antonio, Texas, as Lucius N. Littauer fellow in pathology at the Collis P. Huntington Memorial Hospital, Boston, and Dr. Edward J. Welch, Milton, assistant medical adviser.

MICHIGAN

University News.—Charles Judson Herrick, Sc.D., Grand Rapids, professor emeritus of neurology, University of Chicago School of Medicine, has given an extensive collection of reprints and books to the department of anatomy at the University of Michigan Medical School, Ann Arbor.

State Medical Election.—Dr. Howard H. Cummings, Ann Arbor, was named president-elect of the Michigan State Medical Society at its recent annual meeting in Grand Rapids and Dr. Henry R. Carstens, Detroit, was inducted into the presidency. The secretary, treasurer, editor and executive secretary are elected annually by the council of the state society at its midwinter meeting in January.

Society News.—Dr. Walter G. Maddock, Ann Arbor, discussed "Surgical Aspects of Gallbladder Diseases" before the Genesee County Medical Society in Flint October 14.—Dr. Frank V. Theis, Chicago, addressed the Marquette-Alger Counties Medical Society September 30; his subjects were "Diagnosis and Treatment of Peripheral Circulatory Disturbances," "Diagnosis and Treatment of Varicose Veins" and "Observations on Biochemical Blood Changes."

Changes in Health Officers.—Dr. Richard F. Boyd, Topeka, Kan., has been appointed director of the Midland County health department, succeeding Dr. Kalman S. von Haitinger, who resigned to engage in private practice in Midland, it is reported. Dr. Boyd has been director of local health services for the Kansas State Board of Health. Dr. Leonard C. Bate, Greenup, Ky., health officer of Greenup County, Ky., has been appointed to a similar position in Iron County, succeeding Dr. Lorin E. Kerr Jr., Stambaugh, who resigned to go to Ohio.

NEW JERSEY

Hospital News.—Dr. Ernst P. Boas, New York, gave the first of a series of lectures at Aurora Institute, Morristown, October 5, on "Angina Pectoris, Coronary Insufficiency and Cardiac Infarction."

Industrial Medicine and Civilian Defense.—The fourth annual fall clinical conference of the Medical Society of New Jersey will be held, December 3, in Elizabeth on the theme "Industrial Medicine and Civilian Defense." The morning session will be devoted to clinical presentations at the Elizabeth General Hospital, St. Elizabeth Hospital and the Alexian Brothers' Hospital, Elizabeth. Scientific papers will make up the afternoon's program and in the evening the banquet will be addressed by Johannes Steel, radio commentator.

NEW YORK

Society News.—Dr. James M. Blake, Schenectady, was elected president of the State Association of Superintendents and Managers of Tuberculosis Sanatoria at the annual meeting in Utica, September 19, and Dr. Robert E. Plunkett, Albany, was reelected secretary.—Dr. Herman O. Mosenthal, New York, addressed the Medical Society of the County of Nassau, Garden City, September 30, on "Treatment of Diabetes."—Dr. Walter L. Niles, New York, addressed the Medical Society of the County of Westchester, White Plains, October 21, on "The Art of the Practice of Medicine."—Dr. Russell Plato Schwartz, Rochester, addressed the Chemung County Medical Society, Elmira, September 10, on "Growing Feet of Children."—Drs. John H. Born, New York, and Seth R. Jagger, Westhampton Beach, addressed the Hampton Clinical Society, September 19, on "Common Diseases of the Eye" and "Congenital Abnormalities" respectively.

New York City

Dr. Du Bois Honored on Retirement.—Friends and colleagues of Dr. Eugene F. Du Bois gave a dinner, October 9, at the Waldorf-Astoria to mark his retirement as physician in chief of the New York Hospital and professor of medicine at Cornell University Medical College. He will continue as professor of physiology and head of the department of physiology and biophysics. Dr. Du Bois has been connected with Cornell since 1910, first as instructor in applied pharmacology, then associate professor of medicine and since 1930 professor of medicine. He had been physician in chief of the New York Hospital since 1932. He has also been medical director of the Russell Sage Institute of Pathology. Dr. Du Bois received his degree at Columbia University College of Physicians and Surgeons in 1906.

Award to Mrs. Ehrlich.—The widow of the discoverer of arsphenamine, Mrs. Paul Ehrlich, was presented with a check for \$1,000 at a dinner, October 11, held to commemorate the thirtieth anniversary of the discovery. Dr. Ehrlich died in 1915. The dinner was given at the Waldorf-Astoria by the National Anti-Syphilis Committee under the auspices of the American Social Hygiene Association. The speakers included Dr. Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C.; Dr. Hubert S. Howe, chairman of the Committee on Research on Syphilis, and Mrs. Ehrlich. Hon. Frances Payne Bolton, Cleveland, Member of Congress and vice chairman of the antisiphilic committee, presided. Mrs. Ehrlich has been in this country for two months as a refugee from Germany, according to the *New York Times*.

Society News.—The New York Surgical Society was addressed, October 22, among others, by Dr. William L. Watson on "Surgery of the Cervical Esophagus."—Speakers at a meeting of the Medical Society of the County of New York, October 27 were Dr. Nathan B. Van Etten on "Triumphs of Optimism in Social and Scientific Medicine, 1841-1941" and the Hon. Bernard L. Shientag, judge of the Supreme Court of the State of New York, on "Whither Medicine?"—Dr. John J. Bourke, Albany, N. Y., addressed the Bronx County Medical Society, October 22, on "Health Defense and Emergency Medical Service and Their Relation to the General Defense Program in New York State" and Dr. Abner Stern gave his official address on becoming president of the society.—Dr. Robert S. Hotchkiss addressed the Bronx Gynecological and Obstetrical Society, October 27, on "Management of Aspermia."—The Brooklyn Academy of Pediatrics was addressed, October 22, by Drs. George A. Jervis, Thiells, on "Metabolic Disorders in Mental Deficiency," and Edward J. Donovan, "Anomalies of the Gastrointestinal Tract in Infants and Children."

NORTH CAROLINA

Bowman Gray Medical School Formally Opened.—The Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, was formally opened on September 11. With Dr. Thurman D. Kitchin, president, presiding, the speakers included:

Mr. Santford Martin, editor, *Winston-Salem Journal and Sentinel*, A Vision Becomes a Reality.

Dr. Thomas T. Mackie, New York, The Challenge of a New Medical School to the Faculty, Students and Community.

Dr. Fred C. Zapffe, Chicago, Responsibilities for the Financial Needs of Medical Education.

In 1939, the Wake Forest College School of Medical Sciences, which offered only the first two years in medical training, announced that it would move to Winston-Salem and expand into a four year school. The change was made possible under a gift from the Bowman Gray Fund from the estate of the late Mr. Gray, a tobacco magnate of Winston-Salem. The building is planned so that the laboratory-classroom portion and the hospital are under one roof with communicating floors. The pediatric wing, a gift of Mr. Richard J. Reynolds, Winston-Salem, will be known as the Catherine Smith Reynolds Wing in honor of his mother. It will accommodate forty children. To the right of the entrance of the hospital, the hallway enters into the first floor of the medical school wing, which is six stories high. On the ground floor is the department of biochemistry containing a classroom to accommodate fifty students, five offices for the staff and five research laboratories. On the second floor is the department of pathology and bacteriology, the third the department of physiology and pharmacology and the fourth the department of anatomy. The fifth floor is occupied entirely by the animal quarters. There are large refrigerating rooms on each floor and constant temperature rooms on the floors occupied by biochemistry and physiology. On each floor at the junction of the medical school wing and the hospital are seminar examining rooms for clinical instruction.

An amphitheater will seat three hundred and fifteen persons. The second floor of one wing contains the surgical wards with eighty-six teaching beds and eleven private rooms. The third floor houses the medical wards with fifty-one teaching beds and forty-six beds for private patients. The entire hospital, including bassinets, has three hundred and forty-seven beds.

The medical curriculum is presented to the student as an integrated whole rather than as departmental projects. From the first day the student is given regular weekly clinics in medicine and surgery, cases being used which illustrate the topics under consideration in anatomy, biochemistry, physiology, pharmacology, pathology and bacteriology. At the end of the four year period each student will be given a comprehensive examination on the entire subject of medicine, including the fundamental sciences. Instead of the customary three months vacation in summer, a two months period is to be given in summer and one month in midwinter. During the senior year each student will be required to spend one month with a practicing physician, preferably one doing general practice in a rural community. These physicians are selected from the group of general practitioners in North Carolina and will be required to report to the school on a written form their impressions of the students' training, pointing out weaknesses that may be in the curriculum. During this period with the practicing physician, as well as during his clerkship, the student will be given opportunity to examine private patients to become acquainted with the problems confronted in the private practice of medicine. Dr. Coy C. Carpenter, dean of the two year school at Wake Forest, is dean of the Bowman Gray School of Medicine.

OHIO

Changes in Health Officers.—Dr. John A. Carter, Batavia, since 1936 health officer of Clermont County, has been named to a similar position in Middletown County.—Dr. Benjamin C. Houghton, Columbus, has been appointed local health commissioner of Upper Arlington.

Bequest to Medical College.—Mrs. Margaret S. Rockhill, Cincinnati, editor of the *Women's Medical Journal*, who died on June 6, left a trust fund to the University of Cincinnati College of Medicine to finance a fellowship in memory of her late husband, Dr. Charles S. Rockhill. The fellowship will be for students specializing in diseases of the chest. After twenty years the trust, which provides for several other gifts, will be closed and the entire estate will go to the university. An estimate of \$35,000 was placed on the estate.

Regional Meeting.—Three New York physicians were guest speakers at the annual meeting of the Northwestern Ohio Medical Association, Napoleon, October 7, as follows: Drs. Rupert F. Carter on "Medical and Surgical Diagnosis and Treatment of Gallbladder Disease"; Irving S. Wright, "The Problem of Peripheral Vascular Disease," and Zacharias Bercovitz, "Diagnosis and Treatment of Acute and Chronic Dysentery." Dr. Hardy A. Kemp, dean, Ohio State University College of Medicine, Columbus, addressed the luncheon session on "Present Day Trends in Medical Education." The meeting was sponsored by the third and fourth councilor districts of the Ohio State Medical Association. The northwestern Ohio Medical Association comprises twenty-two counties in its area.

NYA Health Program Curtailed.—The state medical journal announces that the NYA health program which has been under way in Ohio since last spring has been curtailed because of a reduction in the funds allowed to the state for administrative purposes. The funds now available will not permit the state program to operate all of its work experience projects and leaves no surplus for health activities. A health program is being conducted at each of the five resident centers where youths are housed on a twenty-four hour basis, but for the time being the NYA will be unable to finance other health programs. In some communities, however, the health examinations are being continued by physicians who have been participating without remuneration. At the time of the retrenchment, the physical examination program was in operation in twenty-seven counties and tentative arrangements had been made for its operation in twenty-four other counties.

OKLAHOMA

Dates for State Meeting Changed.—The Oklahoma State Medical Association has announced that its 1942 meeting, originally scheduled for May 4-6, will be held April 29-May 1. The session will be held in Tulsa, with the Tulsa County Medical Society acting as host, and will commemorate the fiftieth anniversary of the association.

Service for the Underprivileged.—The Variety Club of Oklahoma City has erected a building costing \$55,000 and dedicated it to better care for the underprivileged. The club maintains the building and provides free housing, utilities and janitor service for certain health agencies, it is reported. One of the first groups to move into the building was the Oklahoma County Public Health Association.

Society News.—The Ottawa County Medical Society devoted its meeting in September to a pediatric clinic at the Miami Baptist Hospital, Miami; Drs. Frank C. Neff, Kansas City, Mo., and Lawrence E. Maurer, Kansas City, Kan., were the guest speakers.—Dr. Leroy A. Calkins, Kansas City, Mo., addressed the Tulsa County Medical Society in Tulsa, October 27, on "Predicting the Duration of the First Stage of Labor." Dr. Frank A. Stuart Jr., Tulsa, was the speaker, October 13, on "Method to Determine the Prognosis of Fractured Hips."—Dr. Frank M. Keen, Shawnee, addressed the Pottawatomie County Medical Society, October 18, on "Rheumatic Heart Disease."

OREGON

North Pacific Surgical Meeting.—The annual meeting of the North Pacific Surgical Association will be held in Portland, November 10-11. Dr. Stuart W. Harrington, Rochester, Minn., will be the guest speaker. His topics will be "Esophageal Diverticula," "Esophageal Hiatus Hernia" and "Breast Surgery." Other speakers will include:

- Dr. John C. Adams, Portland, Milk Leg.
- Dr. Harry C. Blair, Portland, Compound Fractures.
- Dr. Richard E. Ahlquist, Spokane, Total versus Subtotal Abdominal Hysterectomy.
- Dr. Frank M. Bryant, Victoria, B.C., Rupture of the Uterus with Report of One Case.
- Dr. Leo S. Lucas, Portland, Operative Stabilization of Old Congenital Dislocated Hip.
- Dr. Joseph W. Lynch, Spokane, Brain Abscess.
- Dr. John E. Raaf, Portland, Osteomyelitis of the Skull.
- Dr. Joseph A. Pettit, Portland, Infections of the Lip and Face.
- Dr. Goodrich C. Schaeffer, Portland, Methods of Evaluating Surgical Hand Cleaning.
- Dr. John R. Hand, Portland, Cortical Infections of the Kidney.
- Dr. Alexander H. Peacock, Seattle, Nephrolithiasis with Infection and Surgical Consideration.
- Dr. Donald G. Corbett, Spokane, Renal Infections Associated with Congenital Anomalies of the Urinary Tract and Their Surgical Significance.

PENNSYLVANIA

State Medical Election.—Dr. Robert L. Anderson, Pittsburgh, was chosen president-elect of the Medical Society of the State of Pennsylvania at a meeting of the house of delegates in Philadelphia October 7, and Dr. Lewis T. Buckman, Wilkes-Barre, was installed as president of the society. Dr. Walter F. Donaldson, Pittsburgh, continues as secretary. The next annual session will be held in Pittsburgh October 5-8. The 1941 session of the state society was originally scheduled in Pittsburgh October 6-9 but the meeting was canceled because eight of the city's leading hotels were closed by a strike. The house of delegates met in Philadelphia October 6-8 to transact new business and install the officers.

Philadelphia

Physical Standards Under Selective Service Act.—The Philadelphia County Medical Society devoted its meeting, October 20, to a discussion on "Physical Standards Under the Selective Service Act." Major Frank P. Strome, M. C., U. S. Army, retired, professor of military science and tactics, Jefferson Medical College of Philadelphia, presided and the guest speakers were Lieut. Col. Edgar S. Everhart of the Pennsylvania State National Guard, Lemoyne, representing headquarters for Selective Service, Commonwealth of Pennsylvania, and Col. Leonard G. Rowntree, medical director, Selective Service System, Washington, D. C.

Pittsburgh

Hospital News.—Dr. Edward A. Schumann, Philadelphia, was the guest speaker at the annual "West Penn Day" at the Western Pennsylvania Hospital. His subject was "Leaves from a Gynecologist's Notebook."

Society News.—The Allegheny County Medical Society devoted its meeting October 21 to a symposium on the gallbladder, with the following speakers: Drs. Harry R. Decker, Roy R. Snowden, Samuel R. Haythorn and Frank R. Bailey.—At a meeting of the Pittsburgh Pediatric Society, October 22, Drs. Theodore O. Elterich and Charles F. Elterich spoke on "Pseudohemophilic Diatheses" and Eugene B. Schuster, "Infectious Mononucleosis."

VERMONT

State Medical Meeting and Election.—The one hundred and twenty-seventh annual meeting of the Vermont State Medical Society was held in Burlington, October 2-3. A part of the program was arranged in collaboration with the University of Vermont as a participation in the sesquicentennial celebration of the university. The speakers on the anniversary program were:

- Dr. Albert M. Cram, Bridgewater, Early Medical Education in Vermont (presidential address).
- Dr. Frank H. Lahey, Boston, President of the American Medical Association, The Diagnosis and Management of Lesions of the Large Intestine.
- Dr. Abbott T. Hutchinson, New York, The Mastoid—Some Modifications and Readjustments Toward Better Postoperative Benefits; Also Introducing the Mental Flap.
- Dr. Peer P. Johnson, Beverly, Mass., Acute Pancreatic Disease with an Analysis of Cases.
- Dr. George L. Steele, Springfield, Mass., Coronary Failure.
- Dr. David M. Bosworth, New York, Herniation of the Intervertebral Disk.
- Dr. Kenneth J. Tillotson, Belmont, Mass., The Physiological Approach in the Study and Treatment of Mental Disorders.
- Dr. Charles F. Branch, Boston, The Pathology of the Gangrenous Gallbladder.
- Dr. Ellice M. Alger, New York, Our Glaucoma Problem.
- Dr. Fayette Elmore Hubbard, Montclair, N. J., Anesthesia Hazards.

Guests who addressed other sessions were:

- Dr. Louis A. Buie, Rochester, Minn., A Practical Consideration of Anorectal Disease.
- Dr. Percy S. Pelouze, Philadelphia, Psychogenic Sensory and Functional Disturbances of the Urinary Bladder.
- Dr. Harrison L. McLaughlin, New York, Handling of Complicated Fractures About the Elbow.
- Dr. Roland E. McSweeney, Brattleboro, was chosen president-elect and Dr. Ernest H. Buttles, Burlington, became president. Dr. Benjamin F. Cook, Rutland, was reelected secretary.

VIRGINIA

Medical College News.—A new laboratory for pharmacy was dedicated at the opening of the Medical College of Virginia, Richmond, September 15, as a memorial to the late William G. Crockett, Ph.D., professor of pharmacy at the college for many years before his death in 1940. Funds for the memorial, which is in McGuire Hall, were contributed by friends and professional associates of Dr. Crockett.

Changes in Health Officers.—Dr. Samuel D. Sturkie, formerly of Charlottesville, venereal disease control officer of Alexandria and Fairfax County, has been appointed health officer of Smyth County, succeeding Dr. Willard W. Griggs, Marion, who resigned recently to take charge of the health department in Newport News. —Dr. Henry G. Steinmetz, Arlington, has been placed in charge of the health district incorporating Page, Warren and Shenandoah counties, succeeding Dr. John B. H. Bonner, Luray, who resigned to enter private practice in Elizabeth City, N. C.

WISCONSIN

State Medical Election.—Dr. Francis E. Butler, Menomonie, was chosen president-elect of the State Medical Society of Wisconsin at the annual meeting in Madison, September 10-12, and Dr. Gunnar Gundersen, La Crosse, assumed the presidency. George Larson continues as acting secretary. Next year's meeting will be held in Milwaukee.

Dr. Murphy Named to Chair of Medicine.—Dr. Francis D. Murphy, clinical professor and director of the department of medicine, Marquette University School of Medicine, Milwaukee, has been named to a full professorship in medicine, newspapers reported October 5. The professorship has been endowed by an anonymous donor. Dr. Murphy graduated at Marquette in 1921. He has been clinical director of the Milwaukee County Hospital since 1924 and head of the department of medicine at Marquette since 1928. In 1933 the American Medical Association awarded him a Certificate of Honor for his work on Bright's disease. He is a member of the editorial board of the *American Journal of Digestive Diseases*.

GENERAL

The Poliomyelitis Situation.—Newspapers on October 23 reported that 1 new case in Harford County brought the 1941 total in Maryland to 221 cases, equaling the number reported in 1921. Of the total, 130 are from the counties and 91 from Baltimore City. The worst year in Maryland was 1915, when 333 persons were affected. In Milltown, Wis., schools were ordered closed for twelve days and public gatherings were forbidden to children following an outbreak of poliomyelitis, newspapers reported on October 16.

One Thousand Monkeys for Poliomyelitis Research.—One thousand monkeys from India arrived in Wilmington, Del., October 10, for the National Foundation for Infantile Paralysis, New York, and will be distributed among research groups. All are of the macacus rhesus type. Newspapers reported that these monkeys cost \$15 apiece by the time they reach the research laboratory. The foundation recently displayed cages full of 3 week old white mice to which had been successfully transferred the "Armstrong Lansing" strain of poliomyelitis virus and used this demonstration to point out that the cost of this experimental work can now be reduced by using white mice instead of the monkeys, since 100 white mice can be obtained for the price of one monkey and since the cost of their feeding is negligible.

Industrial Hygiene Foundation.—The sixth annual meeting of the Industrial Hygiene Foundation of America, formerly the Air Hygiene Foundation, will be held at the Mellon Institute, Pittsburgh, November 12-13. Included among the speakers will be:

William M. Gafafer, Bethesda, Md., senior statistician, U. S. Public Health Service, First Results of Foundation's Audit of Sick Absences in Industry.

Comdr. Charles S. Stephenson, Washington, D. C., U. S. Navy, Protection of Workers in Wartime.

Dr. Leroy U. Gardner, Saranac Lake, N. Y., Effect of Arc Welding Fumes on Susceptibility to Tuberculosis.

Theodore C. Waters, Baltimore, chairman, Maryland Occupational Diseases Commission, Trends Toward Compensation for Tuberculosis as an Industrial Disease.

Dr. George Baehr, New York, chief medical officer, Office of Civilian Defense, Protection of Civilians and Industry in Wartime.

Philip Drinker, Ch.E., Boston, What's New in Industrial Health—Engineering Developments and Trends.

David P. Morgan, New York, Chemicals & Allied Products Section, Office of Production Management, Impact of Chemical Priorities on Industry and Industrial Health.

Dr. Royd R. Sayers, Washington, D. C., medical director, U. S. Public Health Service, Findings from Major Studies of Fatigue.

Section on Films in Health Education.—A section on films in health education and medicine has been established at the American Film Center, New York, with Dr. Adolf Nichtenhauser in charge. The section, which has received a three year grant from the Rockefeller Foundation, will be a clearing house and information center on the use and production of health education and medical films. According to an announce-

ment, through this section the American Film Center will evaluate existing health films in collaboration with health experts and publish from time to time lists of recommended films. A production program will be developed in collaboration with competent agencies. Since its beginning in 1938, the American Film Center has cooperated with medical and scientific agencies in the study and production of films. The American Film Center is an educational organization, supported by the Rockefeller Foundation. Dr. Nichtenhauser, who has been engaged in educational cinematography for many years, before joining the center was on the staff of the National Tuberculosis Association and of the New York Tuberculosis and Health Association. He graduated at Medizinische Fakultät der Universität, Vienna, Germany, in 1931.

Christmas Seal Campaign.—The National Tuberculosis Association will launch its thirty-fifth annual Christmas Seal sale on Thanksgiving Day, November 20. The association depends on the public's assistance to carry out its year around program for the prevention and cure of tuberculosis. Ninety-five per cent of the total remains in the states in which it is raised, the remaining 5 per cent going to the national headquarters. More than 900 local committees cooperated with the 1,679 tuberculosis associations throughout the country affiliated with the national group. The sum of \$5,593,179.13 was reported for the total seal sale for 1939 throughout the United States, Alaska, Puerto Rico, Philippine Islands and Hawaii. Of this total \$5,313,520.20 went to the state and local organizations and \$279,658.93 was retained by the national association. According to the annual report of the National Tuberculosis Association, replies from four hundred and seventy-five colleges show that two hundred and forty-eight colleges had tuberculosis programs in 1940 while in 1939 there were only one hundred sixty-five. Thirty other colleges reported that they are ready to undertake projects to find tuberculosis on their campuses. A new service was inaugurated in the Indian field in 1940. In July Louisa J. Eskridge joined the field service of the Office of Indian Affairs as assistant supervisor of health education. Her salary is being paid by the national association and the tuberculosis associations of Oregon, Washington and Wyoming.

In 1907, when the first Seal Sale was held, tuberculosis was the leading cause of death. Now it stands seventh in the list of causes of death and second for the Negro population. The death rate in 1930 for tuberculosis among Negroes was 175 per hundred thousand, while in 1938 it was 135, a decrease of 23 per cent.

Postage Stamp in Memory of Grenfell.—Newfoundland will honor the memory of Sir Wilfred Grenfell, St. Anthony, Newfoundland, and Charlotte, Vt., with the release about December 1 of a 5 cent stamp to commemorate his humanitarian work among the natives of Labrador and Northern Newfoundland. According to the *New York Times*, the design will picture Sir Wilfred on his hospital steamer *Strathcona II* with an iceberg in the background. Dr. Grenfell was born in England in 1865. After a period as house physician at London Hospital, he organized a hospital service for the fisheries of the North Sea and cruised with fishermen from the Bay of Biscay to Iceland, establishing homes for them and providing mission services at sea. In 1892 he went to Newfoundland on a small boat carrying hospital supplies. The following winter the governor of Newfoundland invited Dr. Grenfell to take up regular work along the Labrador coast. He established a hospital and later the International Grenfell Association, which by 1927 had six hospitals, seven nursing stations, four hospital ships, four orphanage boarding schools, fourteen industrial centers, three agricultural stations, twelve clothing distribution centers, a supply schooner and a lumber mill. His headquarters was at St. Anthony and he remained there until 1934. Dr. Grenfell served in the World War as a major in charge of the medical unit sent by Harvard University. He wrote many books about Labrador. Dr. Grenfell died at his home in Charlotte, Vt., Oct. 9, 1940, at the age of 75.

CANADA

Report on Poliomyelitis.—Newspapers reported on October 21 that the poliomyelitis epidemic prevalent in Fredericton appears to be at an end. Only 1 case of the disease had been reported in the previous twenty-four hours, bringing the total number of cases in the province to 363. Altogether sixteen deaths had been recorded in the outbreak.

CHRISTMAS SEALS



Protect
Your Home from
Tuberculosis

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 20, 1941.

Changes in the Pharmacopeia

The fourth addendum to the British Pharmacopeia, the third published during the war, has appeared. The object of the Pharmacopeia Commission has been to recognize new preparations which war experience has brought to light and to make changes in the interests of economy without creating difficulties. New descriptions of and standards for certain chemicals formerly supplied only as proprietary preparations, several of which were imported from Germany, are given. Among them are sulfanilamide; suramin, which replaces "Bayer 205" used in the treatment of trypanosomiasis, and pamaquin, which replaces the proprietary "plasmoquin." Digoxin, a proprietary prepared from *digitalis lanata*, still covered by patents, is included. This is relaxation of the practice of excluding articles for which a monopoly exists. Absence of ordinary sources brought about by the war account for some changes. Indian squill takes the place of Mediterranean squill. The test of halibut liver oil has been altered to admit oils from the Pacific Coast. A synthetic optically inactive menthol is introduced because of lack of the natural menthol imported from Japan and of the synthetic product from Germany. Mandelic and nicotinic acids, benzyl benzoate (now much used for the treatment of scabies), bismuth subgallate (an antiseptic dusting powder known as "dermatol"), ephedrine (of which the hydrochloride has been in the pharmacopeia) for the making of oily preparations and light liquid paraffin (for sprays) have been added. Proflavine is introduced because of preference over acriflavine.

There are some changes in pharmaceutical procedure. Tyndallization (sterilizing by intermittent heating) has been found unreliable in dealing with infective spores. The method now adopted is heating at 98-100 C. in the presence of a bactericide. Bactericides specified are chlorocresol 0.2 per cent or phenylmercuric nitrate 0.002 per cent. There are new preparations for injections—procaine and epinephrine, 2 per cent, sodium morrhuate, and quinine and urethane. They must be sterilized with chlorocresol. Sodium hydroxide is introduced because of the difficulty of obtaining the potassium compound. Morphine sulfate is the salt most commonly used for hypodermic injection, the tartrate having gone out of use. Glycerin is excluded as far as possible; glycerite of tannic acid may now contain no glycerin; tannic acid is dissolved in distilled water and thickened with tragacanth. Potable water is recognized instead of distilled water for a number of preparations, such as aromatic waters. This is a measure of economy.

The Food Situation

The food minister, Lord Woolton, states that we have all the essential food we require. After nearly two years of war there is no sign of shortage or malnutrition. But there are restrictions of many foods, particularly of meat, butter and milk. In the coming winter adults will get less milk in order that children may get more. The position as to fats is now secure, thanks to help from America. It was because of lack of fats that Germany broke in the last war. "As to meat," the minister says, "everyone wants more, but I can't do it. If I get a surplus I shall not give it to the ordinary folk; it will go to places where it is needed most—to the mines and industrial plants." The ration of meat is only 24 cents per week and a pound of beef or mutton costs 36 cents. However, the highly nutritious offals, fish and poultry are not rationed. There is an ample supply of cereals and a greater number of people are learning the value of foods made from the whole grain.

"Schering" Now Entirely British

In a previous letter to *THE JOURNAL* the conversion of the branch in England of the great German chemical firm of Schering into a British firm was reported. Some further details can now be given. All the German Schering interests in this country have been acquired by a British group which comprises three companies: British Schering, Ltd., British Schering Research Laboratories, Ltd., and British Schering Manufacturing Laboratories, Ltd., each complementary to the other. Existing Schering products will be made by British Schering Manufacturing Laboratories, Ltd. Research will be developed henceforth by British Schering Research Laboratories, Ltd., of which Dr. D. H. Hey, of the department of organic chemistry, Imperial College of Science and Technology, has been appointed director. Existing Schering products will be made by British Schering Manufacturing Laboratories, Ltd. The necessary patents having been acquired and preparations hitherto sold in this country will, after the present stocks are exhausted, be of British manufacture. The entire personnel of all three companies is British born and the financial interest is wholly British.

Medical Help for Russia

The prime minister has asked Sir Charles Wilson, president of the Royal College of Physicians, to join the British mission to Moscow in order to report to him on any medical help that should be given to Russia.

SWITZERLAND

(From Our Regular Correspondent)

Aug. 15, 1941.

Scientific Research in Switzerland

Dr. Paul Karrer, professor of chemistry in Zurich, recently discussed scientific research, which has assumed great significance for Switzerland because of the greater need of substitutes. Switzerland's scientific leadership in a number of industrial fields has been imperiled of late by the fact that scientific research in Switzerland is supported neither by the state nor by individuals to the extent as is done abroad. A hundred years ago the founding of Swiss universities entailed financial sacrifices. Nothing at present is being done that is in any wise comparable. Not only the larger countries but also the smaller ones have set up research bureaus and provided maintenance funds, thus mobilizing creative production. Swiss universities are obliged to work with very modest funds.

Hospital Facilities for the Canton of Zurich

The new hospital facilities for the canton of Zurich, long under discussion, now await execution. The general plan includes a medical clinic, a medical polyclinic, a surgical clinic, a radiologic institute, an institute of physical therapies, an otorhinolaryngologic clinic, a clinic for nervous diseases, a psychiatric polyclinic, an accident division, an eye clinic, a cantonal dispensary and a pathologic institute. The construction costs will amount to 48,800,000 francs. The land to be used is situated along the Zurich mountain, where university buildings already exist. The medical and surgical clinics will be housed in a six story building and contain four hundred and eighty-five beds. The medical polyclinic and the special clinics will have two hundred and seven beds at their disposal. Construction will be spread out over six years.

Experimental Phosgene Poisoning

Prof. E. Rothlin reported to the medical society of Basel the results of experiments on rats with phosgene intoxications. Phosgene belongs to the so-called green cross war gases. These experiments indicate that calcium therapy must be instituted promptly and applied in quite large doses. In investigations conducted during the World War Heubner, Magnus and others stated that the lungs constitute a barrier to phosgene. Ross,

however, of the medical clinic of Basel, had expressed a different view in 1913. He had based his conclusions on observations of 2 cases of occupational phosgene poisoning. Rothlin's experiments seem to indicate that the lungs do not constitute such a barrier. A component of the central nervous system must be assumed to be the cause of pulmonary edema, as well as a pulmonary reflex with the vagus and the sympathetic. Rothlin's investigations also showed that phosgene is not so easily neutralized in water as was previously assumed.

Population Statistics for 1939

The declining birth rate in Switzerland has not yet come to a halt. Statistics for 1939 show that the birth rate exceeded the death rate by only 3.4 per thousand inhabitants (1938, 3.6; 1937, 3.7; 1936, 4.2; 1930, 5.6; 1920, 6.5; 1910, 9.9; 1902, 11.5). The difference between the birth rate in 1939 and the highest on record (1902) was 8.1. In the last seven decades very low levels were recorded only twice, owing to an abnormally high mortality, namely in 1871 (1.4) and 1918 (0.6). The average figures for birth excess and death rate show that the declining birth rate was accompanied by a steadily decreasing mortality. The death rate seems to have attained its lowest record in 1934 and 1937 with 11.3. The mortality rate rose in 1938 and 1939 to 11.6 and 11.8 respectively.

The number of marriages contracted had no significant influence on the birth rate. Since 1871, with a few exceptions, the number of marriages showed upward and downward variations per thousand inhabitants, fluctuating between 6.8 and 7.9 (1931-1935, 7.7; 1936-1939, 7.3; 1939, 7.5). Likewise the average marriage age of single men and women, which had risen from 28.5 to 28.9 for men and from 26.1 to 26.7 for women, was scarcely of any importance. However, a connection does exist between birth rate and urban population. The four large cities, totaling 741,900 inhabitants in 1939, showed the following ratios between marriages, live births, deaths and birth excess: 10.3, 11.1, 10.3 and 0.8. Communities averaging a 5,000 and a 10,000 population and totaling 418,150 inhabitants showed the following ratios: 6.9, 14.1, 11.6 and 2.5 of birth excess. Communities under 5,000, totaling 2,405,650 registered inhabitants, showed similar ratios of 6.5, 17.4, 12.3 and a 5.1 excess of births over deaths. These figures indicate that the smaller the town, the smaller the number of marriages, but the larger the birth rate, the mortality rate and the excess of births over deaths.

BUCHAREST

(From Our Regular Correspondent)

Sept. 8, 1941.

The Treatment of Scabies at the Front

The medical authorities of the Rumanian army have adopted the Danish method of treating scabies. The advantages attached to this method are: 1. It is easy of application. 2. A single inunction suffices. 3. Cutaneous irritation is slight. 4. After twenty-four hours the scabies is cured. The average cost of the ointment for an adult is 180 to 200 lei—approximately 80 to 85 cents. The principle of treatment lies in the production of sulfureted hydrogen when the ointment is placed on the skin. An excess of alkalinity must be avoided in the preparation of the ointment, which should be smeared on and not rubbed into the skin. Captain Fagaraseanu treated 198 patients with scabies by this method, with only 5 failures (due to not following the directions given), and with the development of 3 cases of dermatitis when the treatment had been used continuously for four to five days.

Precaution Against Air Raids

The Ministry of Public Health has made far reaching arrangements for protection against air raids and gas attacks. A circular has been sent to public health inspectors ordering them to give lectures on how to make air shelters, how to

build new houses to make them bomb proof, how to equip existing houses with the necessary equipment prescribed by the War Ministry and how to use gas masks. Such lectures and courses already have been held several times. Special committees have been appointed in each municipality to visit all houses and decide whether the basements and cellars render satisfactory protection and are gas proof and to advise how to render them safe. The same committee has to supervise the plans of new buildings, which must be provided with gas-proof basements, having accommodations for all the tenants. Landlords who are short of the means to make extensive and expensive transformations on their houses to answer to the requirements of air raid precautions obtain corresponding loans from the state; they pay no interest whatever and have the option to repay the loan in instalments extending to fifteen years.

Cardiac Complications of Influenza

From experience gained during epidemics in Rumania in the last ten years, Dr. I. G. Popescu lectured before the medical society on the cardiac complications of influenza. Cardiac influenza may be manifested by endocarditis, pericarditis, bradycardia, arrhythmia and cardiac neuralgia. Most of the cases occur between the ages of 20 and 40 years. The influenza virus may arouse old lesions into fresh activity, create new lesions and upset the cardiac equilibrium by affecting the nervous system. The prognosis is grave, especially when there is an organic lesion of the heart. Sudden death is not uncommon, and complications such as embolism, pyemia, cardiac failure and collapse may occur. Popescu said that mental disorders following influenza were met only in exceptional cases. Most of these developed at the end of the febrile stage during the period of asthenia and showed a more or less confusional type of psychosis, the symptoms being most pronounced in those with a psychopathic history. In a few cases the most conspicuous feature was pronounced amnesia. In almost all the cases improvement in the mental condition coincided with improvement in the general physical state of health.

Marriages

HAROLD ERVIN STADLER, 1st Lieutenant, Medical Reserve Corps, United States Army, Fort Benjamin Harrison, Ind., to Miss Doris Jane Goldsmith of Indianapolis, September 14.

JOHN H. SHAMEL, Ashkum, Ill., to Miss Frances Lee Richeson of Chillicothe, Mo., at Canton, Mo., August 10.

DAVID ALEXANDER WILSON, Dover, Del., to Miss Ruth Brinkley Alexander in Durham, N. C., in October.

DONALD O. MANSHARDT, Chicago, to Miss Betty Schilling of Bippus, Ind., at La Porte, Ind., September 6.

JOE HUMPHREYS, Indianapolis, to Miss Genevieve Gohring of Rushville, Ind., at Indianapolis, August 10.

ARTHUR AARON DERRICK JR. to Miss Sidney Ella Shrock, both of Goodman, Miss., in Jackson, July 18.

JOHN CALVIN GRIER JR., Charlotte, N. C., to Miss Alice May Donaldson in Fort Worth, Texas, July 24.

WALTER ROLFE NEWBERN, Fort Benning, Ga., to Miss Shirley Stimpson of Statesville, N. C., October 4.

GEORGE DEAN JOHNSON to Miss Elizabeth Brown Heath, both of Spartanburg, S. C., October 11.

ROBERT N. KABEL, Winchester, Ind., to Miss Virginiabell Acker of New Castle, September 6.

WILLIAM THOMAS PUGH, Lynchburg, Va., to Miss Frances Kendig of Kenbridge, August 16.

HYMAN WARNER GELLER, Atlanta, Ga., to Miss Sylvia Jaffe of Hempstead, N. Y., August 17.

FRANK ROBERT BONDI, McKeesport, Pa., to Miss Dorothy Ann Dunn of Greenock, July 7.

MARSHALL R. LOUIS, Auburn, N. Y., to Miss Louise Stern of Rochester, October 19.

WILLIAM M. HOWDON, Miami, Fla., to Miss Arline Kaye of Miami Beach, July 19.

Deaths

Max Brödel, recognized as founder of the art of medical illustration in the United States, associate professor of art as applied to medicine at the Johns Hopkins University School of Medicine, Baltimore, died October 26, aged 71. He was born at Leipzig, Germany, June 8, 1870 and was educated at the Academy of Fine Arts at Leipzig and at the University of Leipzig. Early in his career he became associated with Karl Ludwig, noted physiologist, and served as medical illustrator of anatomy and physiology at the University of Leipzig until 1893. In 1888 he met Franklin P. Mall when the latter was working in Leipzig. Then in 1894, at the suggestion of Mall, Max Brödel came to Baltimore to make illustrations for the book on gynecology written by Dr. Howard A. Kelly. Since that



MAX BRODEL 1870-1941

time he has illustrated many notable works in the field of medicine, including particularly the writings of members of the Johns Hopkins faculty—Halsted, Cullen and many others. In 1910 gifts made to Johns Hopkins University by Mr. Henry Walters enabled the continuation of the work of Brödel in that institution, and in 1920 an endowment fund of more than \$100,000 was established for the maintenance of the department of anatomic art. In *THE JOURNAL*, August 30, page 668, appears the final literary contribution of Max

Brödel on the field of medical art as an occupation. In 1938 physicians from the entire country attended a banquet in honor of Max Brödel, at which his portrait, painted by Thomas Corner, was presented to Johns Hopkins University. The many pupils of Max Brödel now teach and work in leading medical colleges and clinics throughout the United States.

George Washington Hall • Chicago; Rush Medical College, Chicago, 1893; Chairman of the Section on Nervous and Mental Diseases of the American Medical Association, 1929-1930; at one time vice president of the American Medical Golfing Association; instructor in laryngology and diseases of the chest from 1895 to 1901, instructor in materia medica and therapeutics, 1902, instructor in medicine from 1903 to 1905, assistant professor from 1906 to 1910, associate professor of nervous and mental diseases from 1911 to 1924 and clinical professor of neurology since 1925 at his alma mater; member of the American Neurological Association and the Association for Research in Nervous and Mental Diseases; past president of the Central Neuropsychiatric Association; fellow of the American College of Physicians; attending physician, Cook County Hospital, from 1908 to 1912 and attending neurologist from 1913 to 1926; on the staff of the Cook County Psychopathic Hospital from 1918 to 1930; attending neurologist, St. Luke's Hospital since 1916; aged 72; died, October 25, of coronary thrombosis, while attending the meeting of the Central Neuropsychiatric Association in Detroit.

Francis Wayles Shine • Charlottesville, Va.; University of Virginia Department of Medicine, Charlottesville, 1898; member of the Medical Society of the State of New York, American Academy of Ophthalmology and Otolaryngology, American Ophthalmological Society and the Association for Research in Ophthalmology, Inc.; past president of the New York Ophthalmological Society; served during the World War; served at various times and in various capacities on the staffs of the New York Eye and Ear Infirmary, Doctors Hospital and the New York Hospital, New York; aged 67; died, September 24, in the University of Virginia Hospital of myocarditis, hypertension and arteriosclerosis.

Forest Henry Staley, St. Louis; Washington University School of Medicine, St. Louis, 1918; member of the Missouri State Medical Association; fellow of the American College of Surgeons; assistant in surgery at his alma mater from 1917 to 1921, assistant in anatomy from 1921 to 1923 and instructor in anatomy, 1923-1924; instructor in surgery, St. Louis University School of Medicine from 1924 to 1929, senior instructor in surgery from 1929 to 1941 and since 1941 assistant pro-

fessor of surgery; assistant surgeon, St. Mary's Group of Hospitals from 1924 to 1941 and since 1941 associate surgeon; aged 56; died, September 21, in the Firmin Desloge Hospital of subacute bacterial endocarditis.

George Albert Traylor • Augusta, Ga.; University of Georgia Medical Department, Augusta, 1904; associate professor of gynecology at his alma mater from 1919 to 1924 and professor of clinical surgery since 1924; member of the South-eastern Surgical Congress; fellow of the American College of Surgeons; past president of the Medical Association of Georgia; served during the World War; at one time chairman and for many years member of the county board of health; on the staffs of the University Hospital and the Wilhenford Hospital for Women and Children; aged 61; died, September 15, of coronary occlusion.

Jacobo Fajardo y Puno, Manila, Philippine Islands; University of Santo Tomas College of Medicine and Surgery, Manila, 1905; past president of the Philippine Public Health Association; formerly executive health officer of Philippine Islands and director of health, Philippine Health Service; served as chief health officer in the health department of Mindanao and Sulu and as a member of the Philippine legislature; president of the Manila Medical Society in 1926; aged 65; died, July 23, at the Johns Hopkins Hospital, Baltimore, of pneumonia following an operation.

Francis Goodwin Du Bose • Maplesville, Ala.; Medical Department of Tulane University of Louisiana, New Orleans, 1893; member of the Southern Surgical Association; fellow of the American College of Surgeons; past president of the Alabama Hospital Association; consulting surgeon for the Marion Military Institute and member of the Alabama State Board of Examiners for Nurses; formerly chief of staff of the Vaughan Memorial Hospital, Selma; aged 68; died, October 1, of coronary occlusion.

Henry King McHarg Stephens, New York; Emory University School of Medicine, Atlanta, Ga., 1926; member of the Medical Society of the State of New York and the American Academy of Dermatology and Syphilology; on the staffs of the Bellevue Hospital and St. Vincent's Hospital; aged 39; died, September 25, of cerebral hemorrhage.

Alexander Stedman Wilson, Tampa, Fla.; Rush Medical College, Chicago, 1896; from 1896 to 1926 served as a medical missionary in India; medical officer in the British Army Reserves in India during the World War; aged 69; died, September 13, in the Walter Reed General Hospital, Washington, D. C., of coronary thrombosis.

Samuel Saffell Bogle • Santa Rosa, Calif.; University of Tennessee Medical Department, Nashville, 1891; district surgeon of the Northwestern Pacific Railroad for many years; formerly superintendent of the Sonoma County Hospital; aged 74; died, September 27, in the Southern Pacific General Hospital, San Francisco, of aplastic anemia.

Charles Roe Marney, Tampa, Fla.; Atlanta (Ga.) College of Physicians and Surgeons, 1913; member of the Florida Medical Association; past president of the Hillsborough County Medical Society; served during the World War; aged 59; on the staff of the Municipal Hospital, where he died, September 17 of mesenteric thrombosis.

Leroy Worth Kuser • Gainesville, Texas; Baylor University College of Medicine, Dallas, 1913; past president of the Cooke County Medical Society; formerly member of the school board; on the staff and for many years secretary-treasurer of the Gainesville Sanitarium; aged 65; died in September at Santa Fe, N. M.

Ira Edgar Freyman, Weatherly, Pa.; Medico-Chirurgical College of Philadelphia, 1907; member of the Medical Society of the State of Pennsylvania; served during the World War; formerly member of the board of health of Weatherly; aged 61; died, September 19, at Philadelphia of coronary occlusion and arteriosclerosis.

John Webster McGehee • Reidsville, N. C.; University of Maryland School of Medicine, Baltimore, 1904; past president of the Rockingham County Medical Society; bank president; on the staff of the Memorial Hospital; medical examiner for the local draft board; aged 61; died, September 23, of coronary occlusion.

Henry Anthony Strecker • Philadelphia; Jefferson Medical College of Philadelphia, 1894; served as assistant chief medical inspector from 1909 to 1923 and as medical director in charge of private schools from 1923 to 1931; for many years on the staff of the Jefferson Hospital; aged 69; died, September 30.

George Dawson Walker, Johnston, S. C.; Atlanta (Ga.) College of Physicians and Surgeons, 1905; member of the South Carolina Medical Association; member of the board of health;

aged 62; died, September 28, in the South Carolina Baptist Hospital, Columbia, of cerebral embolus and carcinoma of the left lung.

George Loring Tobey Sr., Bremen, Maine; Medical School of Maine, Brunswick, 1879; member of the Massachusetts Medical Society; member of the selective board during the World War; formerly on the staff of the Clinton (Mass.) Hospital; aged 88; died, September 18, of coronary thrombosis.

Herbert Cholerton Ⓢ Somerville, Mass.; Harvard Medical School, Boston, 1901; member of the New England Obstetrical and Gynecological Society; formerly chairman of the school committee; aged 68; on the staff of the Somerville Hospital; died, September 25, of lymphoblastoma of the mediastinum.

Archibald McNeil, Westport, Conn.; Dartmouth Medical School, Hanover, N. H., 1896; at one time professor of bacteriology at the New York Medical College and Flower Hospital; aged 75; died, October 13, in the Norwalk (Conn.) General Hospital of ruptured esophageal varix.

William Milton Wallace, Johnstown, Pa.; Cleveland Homeopathic Medical College, 1904; member of the Medical Society of the State of Pennsylvania; aged 63; died, September 23, in the Mercy Hospital of a blood stream infection complicated with acute endocarditis.

George Russell Curl, Chicago; Eclectic Medical College, Cincinnati, 1910; member of the Illinois State Medical Society; served during the World War; aged 57; formerly on the staff of the Veterans Administration Facility, Hines, where he died, October 8, of cerebral hemorrhage.

William Reed Dickson Ⓢ McDonald, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1893; past president of the Washington County Medical Society; served during the World War; member and past president of the school board; aged 73; died, September 28.

Willis R. Moss Ⓢ Clinton, Ky.; University of Louisville Medical Department, 1893; president of the Hickman County Medical Society; past president of the board of health of Hickman County; aged 73; died, September 21, at the Baptist Hospital, Memphis, Tenn.

Oscar Luna Smith, Atlanta, Texas; Gate City Medical College, Texarkana, Ark., 1906; member of the State Medical Association of Texas; aged 57; was found dead, September 9, in the North Louisiana Sanitarium, Shreveport, La., of acute dilatation of the heart.

Howard Jesse Wright, Des Moines, Iowa; Drake University Medical Department, Des Moines, 1901; formerly county coroner; served during the World War; aged 70; died, September 31, of injuries received in an automobile accident near Columbia, Mo.

William Andrew Henneger, Dubuque, Iowa; State University of Iowa College of Medicine, Iowa City, 1908; member of the Iowa State Medical Society; served during the World War; aged 54; died, September 12, in St. Joseph Sanitarium of heart disease.

Albert Thomas Martin Ⓢ Huntington Park, Calif.; Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main, Prussia, 1922; member of the Radiological Society of North America, Inc.; aged 42; died in September.

Cedric Hughes Archibald, Ottawa, Ont., Canada; University of Toronto Faculty of Medicine, 1918; served during the World War; assistant psychiatrist in the Pensions and National Health Department; aged 47; died, September 5.

Carlo B. Marcum, Berca, Ky.; University of Louisville Medical Department, 1914; member of the Kentucky State Medical Association; on the staff of the Berea College Hospital; aged 52; died, September 20, of coronary occlusion.

Charles Edney Burnham, Bay Springs, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1900; member of the Mississippi State Medical Association; formerly county health officer; aged 70; died, October 1.

Frank Edward Toole Ⓢ New Haven, Conn.; Yale University Medical School, New Haven, 1919; aged 49; on the staffs of the Grace Hospital and the Hospital of St. Raphael, where he died, September 24, of coronary thrombosis.

Arthur Clifton Branch, Glennville, Ga.; Medical Department of Tulane University of Louisiana, New Orleans, 1910; member of the Medical Association of Georgia; aged 58; died, September 30, in Jesup following an appendectomy.

Ptolemy P. Chambers, Holly Hill, Fla.; Medical College of the State of South Carolina, Charleston, 1907; aged 57; died, September 27, in the Warren A. Candler Hospital, Savannah, Ga., of carcinoma of the neck, jaw and face.

John A. Stevens, Aliquippa, Pa.; Jefferson Medical College of Philadelphia, 1908; member of the Medical Society of the State of Pennsylvania; formerly county medical director; aged 59; died, September 21, of coronary occlusion.

Charles Edward Marquis, Oakland, Calif.; Washington University School of Medicine, St. Louis, 1923; aged 47; died, September 12, in the Peralta Hospital of gastric hemorrhage and hypertrophic cirrhosis of the liver.

Patrick Francis Kelleher Ⓢ Cambridge, Mass.; Tufts College Medical School, Boston, 1896; formerly on the staffs of St. Elizabeth's Hospital, Boston, and Cambridge City Hospital; aged 73; died, September 25.

Edward Gilbert Trowbridge, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1897; aged 86; died, September 29, in the Evanston (Ill.) Hospital of arteriosclerosis, and auricular fibrillation.

Gertrude Taft, Los Angeles; University of Southern California College of Medicine, Los Angeles, 1893; formerly a medical missionary in China; aged 75; died, September 10, of heart disease and arteriosclerosis.

Amerida M. Gross Ⓢ Hazard, Ky.; Hospital College of Medicine, Louisville, 1905; at one time county judge and sheriff; aged 61; died, September 29, in the Hazard Hospital of malignant hypertension.

James Mitchell Doughty, Tucumcari, N. M.; Chattanooga (Tenn.) Medical College, 1904; formerly member of the state board of medical examiners; aged 63; died, September 30, of cerebral arteriosclerosis.

Jacob Cicero Warmack Ⓢ Oklahoma City; Gate City Medical College, Texarkana, Ark., 1907; at one time on the staff of Wesley Hospital; aged 71; died, September 26, of coronary occlusion.

John M. Price, Tifton, Ga.; University of Georgia Medical Department, Augusta, 1886; aged 83; died, September 18, in a hospital at Waycross of acute dilatation of the heart.

Elgin Howard Shildrick, Cleveland; University of Wooster Medical Department, Cleveland, 1896; aged 72; died, September 1, of coronary artery disease.

William Coleman Norris, Quitman, Miss.; Mississippi Medical College, Meridian, 1908; served during the World War; aged 59; died, September 10.

Martin Lee Wilbanks Ⓢ Greenville, Texas; Barnes Medical College, St. Louis, 1902; aged 67; died, September 21, in Leonard, of coronary thrombosis.

James Henry Smoot, Woodstock, Va.; University of Maryland School of Medicine, Baltimore, 1892; aged 74; died, September 25, of tuberculosis.

Percy Kaufman Heller, Rochester, Pa.; University of Pittsburgh School of Medicine, 1908; aged 55; died, July 24, at Coatesville, of hemiplegia.

Charles Hurlburt Burritt, Claremont, Calif.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1890; aged 77; died, September 20.

George Calhoun Pruitt, Atlanta, Ga.; Atlanta College of Physicians and Surgeons, 1911; aged 54; died, September 26, of coronary arteriosclerosis.

Carroll Hotchkiss Browning Ⓢ Oberlin, Ohio; Western Reserve University Medical Department, Cleveland, 1925; aged 41; died, September 30.

Lorena Welbourne-Shelley, Steelton, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1924; aged 46; died, September 7.

Walter P. King, Shaw, Miss. (licensed in Tennessee in 1903); also a minister; aged 77; was killed by a freight train in September.

Alexander Smith McCaig, Sault Ste. Marie, Ont., Canada; University of Toronto Faculty of Medicine, 1896; aged 60; died, July 3.

Herman Schwartz, New York; University and Bellevue Hospital Medical College, New York, 1903; aged 65; died, August 20.

John Dougal McGregor, El Paso, Texas; Bellevue Hospital Medical College, New York, 1882; aged 82; died, August 26.

James H. Bute, Houston, Texas; Georgetown University School of Medicine, Washington, D. C., 1899; aged 62; died, August 28.

Emily H. Selby Ⓢ Chicago; Harvey Medical College, Chicago, 1901; aged 80; died, September 9, in the Presbyterian Hospital.

Otto Grismore, Steubenville, Ohio; Eclectic Medical Institute, Cincinnati, 1903; aged 62; was found dead, September 9.

Jalmar Melvin Hofto Ⓢ Grand Forks, N. D.; Rush Medical College, Chicago, 1924; aged 44; died, August 26.

Bureau of Investigation

POST OFFICE DEPARTMENT TURNS OFF SOME LIGHTS

Ever since George Starr White issued his first bit of nonsense about the therapeutic effect of colors there has been a more or less continuous promotion of color therapy by those who dabble in pseudomedicine. Previous articles in THE JOURNAL dealing with the use of color therapy include the following:

- "Spectro-Chrome Therapy" (Dinshah P. Ghadiali), Jan. 6, 1924, page 321.
- "George Starr White—Quack," April 13, 1929, page 1292.
- "The 'Spectro-Chrome' and 'Hocus Pocus'" (Dinshah P. Ghadiali and E. A. Ernest), Aug. 1, 1936, page 362.
- "Chromoray—Trioray" (Dinshah P. Ghadiali, E. A. Ernest, George Starr White and Karl von Schilling), Oct. 15, 1938, page 1490.

In 1941 the Post Office Department at Washington issued two fraud orders against persons and concerns which exploited the color therapy buncombe and in each case found it necessary to extend the fraud order to cover certain new names they were discovered to be using as evasions.

E. A. ERNEST AND THE ERNEST DISTRIBUTING COMPANY, MILWAUKEE

Ernest is the person mentioned in two of the titles listed. The 1938 article discussed at length the hokum that Ernest employed in promoting his two devices "Chromoray" and "Trioray" in the field of so-called color therapy. Further, it pointed out that Ernest's concern had at different times represented itself as distributor for Karl von Schilling's "Vita Chrome (Life Colors)" device and Dinshah P. Ghadiali's "Spectro-Chrome Therapy" machine. Eventually he broke off these connections to go into the same field on his own. As the article commented, "If one is in the hocus-pocus business, why split the swag?"

In due time the Post Office Department began to look into Ernest's scheme of selling through the mails his "Trioray" (colored hand lenses) and his other device, a color lamp which had come to be known by the hyphenated title "Chromoray-Focoray." The investigation developed the facts that Ernest, who claimed to have taken a correspondence course in civil engineering and also displayed a diploma issued by the "National College of Electro-Therapeutics," had been in the ornamental bronze business from 1902 to 1929; that some time after discontinuing it he got possession of a book, "The Principles of Light and Color," by Edwin D. Babbitt (which was published in 1878 but is said to have no standing among authorities on physical therapy) and that in 1933 Ernest commenced his color-light business. It was further shown that Ernest was promoting his devices by false and fraudulent pretenses, representations and promises, such as that when used as directed they would emit color rays which would prevent or cure "practically every known disorder," including, among others, appendicitis, arthritis, asthma, cancer, cataract, diabetes, pneumonia, prostatic troubles, rheumatism, rupture, sleeping sickness, tuberculosis, venereal diseases and bubonic plague! It is not surprising that Ernest did not put up a defense in this case and that the Post Office issued a fraud order dated March 17, 1941 debarring the further use of the mails to E. A. Ernest and the Ernest Distributing Company.

Less than two months later, however, the Post Office discovered that Ernest was continuing his fraudulent business under a new trade style, Ernest Short Wave Company. A letter addressed to that name at Milwaukee brought a reply offering for sale not only a so-called short wave device but also the "Chromoray-Focoray" and "Trioray." Although this communication was sent on the letterhead of the Ernest Distributing Company there was added to this title as a precaution the stamped notation "Make payments and address all communications to Ernest Short Wave Co." As this scheme was obviously an evasion of the fraud order issued against Ernest two months earlier, the Post Office, on June 12, 1941, extended that order to cover the names of Ernest Distributing Company and its officers and agents, including E. A. Ernest himself.

ERNEST J. STEVENS

For many years this person has been doing business chiefly from San Francisco. As long ago as 1920 his letterhead gave that city and Philadelphia as his addresses and played up the "Stevens Health Inventions Company" with the subhead "E. J. Stevens, M.S., Inventor." The list of his devices then included "Nebulizers (3 Styles), Balsam Bath Inhalants, Balsam Inhaling Masks (2 Styles), Semi-automatic Air Pumps (2 Styles), Internal Bath Outfit (Colon and Vaginal), Balsam Vaporizer (Pocket Size), Physicians' Balsam Vaporizer (Pocket Size), Electric Light Bath Cabinets" and "Electric, Steam and Hot Air Outfits, Hydro, Color and Light Therapy, Vibratory and Massage Outfits." The same letterhead also bore the name "Stevens Light & Color Institute," and the letter, addressed to a physician, offered to "sell, rent or exchange, for office or home use, electric light bath cabinets, the light and color applicators and arm and leg baking outfits. We also supply therapeutic lamps and violet rays and chair vibrators, etc."

It was, of course, to the "drugless healers" that Stevens made his principal appeal. A clipping credited to the Spokane, Wash., *Review*, July 27, 1924, reported that "E. J. Stevens, of the

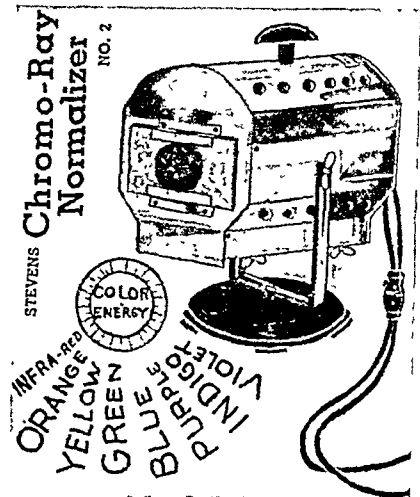


Illustration from Stevens' advertising.

Stevens Light and Color Laboratories" would be "the chief speaker" at the gathering of the "Washington State Association of Sanipractic Physicians" in Seattle in the following September. Further, Ernest J. Stevens of San Francisco was named as a member of the "Educational Board and Research Department" on the letterhead sent out in March 1924 by the "American Raw Food, Health and Psychological Clubs." The president of this outfit was St. Louis Estes, who once proclaimed himself "The World's Greatest Health Scientist, Psychologist, and International Authority on Old Age, Raw Foods, and Dynamic Oxygenation—The Man who Rebuilt Himself—Old at Thirty, Young at Fifty—Father and Founder of the Raw Food Movement." Obviously not an introvert.

Stevens himself dabbled in many types of quackery. In various health fad magazines there appeared "keyed" advertisements from addresses Stevens used, in which he varied his initials (using "E. N.," "E. H.," for example) or his firm names, and played up his "Nulife, Sex and Diet," "Nature Method Cures" for "Catarrh, Asthma and Lung Trouble," "Science of Colors and Rhythms, etc." and "Vital Sex and Love Facts (Rare Secrets Revealed)."

One of Stevens' freak projects was "The Stevens Occult and Astral Anatomical Human Temple Chart" which, take his word for it, was the "Essence of the Wisdom of Ages." In June 1936 he was listed as "President" on a letterhead of the "Meta Collegiate Extension of the National Electronic Institute, Inc.," at Sparks, Nev., which solicited physicians to take its correspondence courses and become "professional analysts" and "human engineers."

Finally Stevens, like Ernest, came under the scrutiny of the Post Office Department, and a fraud order was issued May 17,

1941 against a long list of trade styles under which he operated. Among these were Stevens Helio-Scientific Company, Rainbow Publishers, E. J. Stevens Publishing Company and the E. J. Stevens Color Institute. According to the government's memorandum on this case, Stevens appeared at the hearing and testified in his own behalf but did not produce any other witness or documentary or scientific evidence. The Post Office presented a number of authorities in the fields of bacteriology and physical therapy who testified as to the worthlessness of the defendant's color ray lamp (variously called "Stevens Helio-Chromo-Energizer," "Stevens Chromo-Ray Normalizer No. 2" and "Stevens Chromo-Ray Projector") in treating the various disorders named, in conjunction with a certain "color charged" water. These disorders included, among others, amenorrhea, anemia, apoplexy, asthma, cancer, cataracts, diabetes, diphtheria, typhoid, smallpox, typhus fever, paralysis, pneumonia, sleeping sickness, venereal diseases and tuberculosis, all of which Stevens' equipment was represented to diagnose, as well as prevent or cure.

It was further shown that Stevens advocated the use of a Japanese substance called "Oil of Kurimonji" to which he ascribed a "magic . . . balsamic, curative action," and a supposedly mysterious "breath of life" or law of breathing called "Pranayama" which purported to keep the body "free from all aches and pains and diseases." The government further showed, among other things, that Stevens claimed to be an "Author, Artist, Physicist, Poet, Chromo-Dietitian, and Expert Human Analyst, christened by Luther Burbank, 'the Burbank of the Human Plant.' . . ." These and many other representations made for himself or his devices were declared to be fraudulent, and accordingly on May 17, 1941 a fraud order was issued against some of the names under which he operated. These were the Stevens Helio-Scientific Company, The Rainbow Publishers, The E. J. Stevens Company, The Rainbow Publishing Company, The E. J. Stevens Publishing Company, The E. J. Stevens Companies, The E. J. Stevens Color Institute and their officers and agents, all of San Francisco.

As in many similar cases, the flaw in this fraud order lay in the omission of Stevens' personal name and so, like some others whose schemes have been debarred from the mails, he flouted the government and continued in business—by operating under a new trade style and local address, Chromolux Company, Stratford Hotel, San Francisco. His device also took on a new name, "Chromolux Lamp." His explanation to those on his mailing list was that his companies had been "reorganized." But this trick was soon detected by the Post Office Department, which on July 12, 1941 issued a supplemental fraud order covering not only the name of Stevens himself but also the Chromolux Company, Lux Stevens and a good many other trade styles, old and new, under which he had been operating.

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," cosmetics or medical devices have agreed with the Federal Trade Commission to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Almklov Preparations—These consist of "Almklov's Scalp and Hair Tonic" and "X.E.M. Salve" put out by C. W. and Sigurd Almklov, Norman A. Hoel and Mrs. William G. Cook, all trading as Almklov's Pharmacy, Cooperstown, N. D. In March 1941 these persons signed a stipulation in which they promised the Federal Trade Commission that they would cease representing that "Almklov's Scalp and Hair Tonic" destroys dandruff, cures itching scalp, keeps the hair from falling out or penetrates the skin to extirpate the bacilli, and that "X.E.M. Salve" is a remedy or cure for eczema, barber's itch, refractory cases of ringworm, athlete's foot, psoriasis, dandruff or any itching cutaneous disorders or that it will remove the cause of these conditions and offer any value in their treatment in excess of affording symptomatic relief of itching and irritation.

Antiseptic Tar Hair Grower—That this possesses antiseptic properties, contains essential oils or vegetable oils, will promote the growth of hair, eliminate itching scalp or be of any value in its treatment beyond affording temporary relief were misrepresentations that Eva B. Smith, trading as E. B. S. Manufacturing Company, New York, promised to withdraw from the advertising, in a stipulation that she signed with the Federal Trade Commission in February 1941. She also promised to withdraw such words as "eliminate" (referring to dandruff) and "antiseptic" and "grower" in the brand name.

Arthrene—The representations that this nostrum "produces circulation, reduces swelling, dissolves crystals or cleanses the blood of uric acid" and is an effective remedy for arthritis, neuritis, sciatica, rheumatism or gout or affords more than temporary symptomatic relief of these ailments were to be withdrawn from the advertising, according to a stipulation signed with the Federal Trade Commission in February 1941 by F. D. Allderice, trading as Arthrene Company, Jacksonville, Fla.

Berkeley Springs Mineral Water—Burke Edwards of Bethesda, Md., who puts this out, promised the Federal Trade Commission in March 1941 that he would cease representing that this water is beneficial in the treatment of arthritis, diabetes, skin diseases or rheumatism.

Colagyn Hygienic Vaginal Jelly and O. M. 41 Hygienic Vaginal Jelly—Smith Laboratory, Inc., Kansas City, Mo., entered into a stipulation with the Federal Trade Commission in March 1941 in which it promised that it would cease advertising that its products sold for feminine hygiene are unfailing contraceptives and that they constitute a competent remedy for certain diseases of women.

Fernet Vittone and Acqua Fuggi—E. Fucini and Company, Inc., New York, entered into a stipulation with the Federal Trade Commission in February 1941 promising to cease representing that the first named product is a tonic beyond its effect as a gastric tonic, that every one requires a tonic, stomachic and digestive; that "Fernet Vittone" is an effective remedy for intestinal disturbances or has any effects other than those of a laxative, stomachic and gastric tonic, or that "Acqua Fuggi" is an effective remedy for gallstones, kidney trouble, gout, bladder stones, defective blood circulation or excessive uric acid. About the same time Ferdinand Pettinella and the Pettinella Advertising Company of New York, which handles the Fucini advertising, signed a similar stipulation with the Commission.

G-I-M-P First Aid—This was represented in the advertising of the Link Chemical Company, Emporia, Kan., as a competent treatment for strains, sprains, muscular aches and soreness and as effective for treating colds and athlete's foot and penetrating into the tissues and killing infection. In February 1941 the Link concern stipulated with the Federal Trade Commission that it would withdraw these misrepresentations from the advertising.

Hess Hair Milk—In March 1941 the Federal Trade Commission accepted from Frank X. Hess, trading as Hess Hair Milk Laboratories, St. Paul, a stipulation in which he agreed to cease representing through the use of testimonials or in any other manner that "Hess Hair Milk" is a "natural treatment" or natural product, that it will prevent falling hair; that it is a hair tonic or scalp conditioner or has any remedial or tonic effects on the scalp or hair; that its use will restore the original, natural or youthful color to gray or faded hair; that it will cause hair to have a youthful appearance, or that it will prevent the appearance of age.

Indian Preparation—Kate J. Hadley, trading as Mrs. W. W. Hadley, Boston, put this out as an effective cure for superfluous hair, representing that it was not a depilatory and that no similar product is used by dermatologists or sold in the proprietary trade; that it will open the pores, loosen the hair follicles, gradually destroy the roots of the hair or remove superfluous hair without injury to the skin. In February 1941 Kate J. Hadley promised the Federal Trade Commission that she would discontinue these misrepresentations in her advertising and also would cease using the word "Indian" either in the trade name or by pictorial representations to give the impression that the formula of her preparation was obtained from the Indian race.

Lillian M. Camp Preparations—These were devices sold for improving personal appearance by Lillian M. Camp of New York, who, in February 1941, promised the Federal Trade Commission to withdraw misrepresentations from her advertising. She agreed to cease claiming that "Superior Hair Pencils" will have any effect on the roots of the hair, that "Leg Pads" are approved by the American Medical Association and that her "Face Lifters" will alter the shape or structure of the face.

Merz-Allium—In February 1941 Merz and Company Chemical Works, Inc., East Orange, N. J., stipulated with the Federal Trade Commission that it would cease advertising this product as being bactericidal and effective in treating colitis, intestinal catarrh, diarrhea, coughs, bronchitis, arthritis, rheumatism, asthma, tuberculosis and some other things and to discontinue the misrepresentation that the preparation produces results not obtainable from any other and is recommended by the "drugless profession." Another government agency, the Food and Drug Administration, had previously taken action against the Merz concern, charging it with fraudulently labeling "Merz Allium." On March 4, 1938 the Merz concern pleaded guilty to the charge in a federal court and was fined \$100.

Pompeian Milk Massage Cream—The Pompeian Company, Inc., of Baltimore signed a stipulation with the Federal Trade Commission in February 1941 agreeing to cease advertising that this product works differently from regular cleansing creams, that it will remove dirt to a greater extent than ordinary cleansing methods including soap and water, and that the use of it will leave the face looking years younger.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO Feb. 16-17, 1942. Council on Medical Education and Hospitals Sec., Dr. William D. Cutter, 535 North Dearborn Street, Chicago

MEDICAL CORPS UNITED STATES NAVY

Examination: Assistant Surgeon with the permanent rank of Lieutenant (junior grade) and Acting Assistant Surgeon with the probationary rank of Lieutenant (junior grade) Jan. 5-9. Examination will be held at the Naval Hospitals at Chelsea, Mass., Newport, R. I., Brooklyn, Philadelphia, Norfolk, Va., Charleston, S. C., Pensacola, Fla., Corpus Christi, Tex., San Diego and Mare Island Calif., Puget Sound Wash., Great Lakes Ill., Pearl Harbor T. H. and Naval Medical Center Washington, D. C. Apply Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

NATIONAL BOARD OF MEDICAL EXAMINERS

EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in *THE JOURNAL*, November 1, page 1558.

BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery, June 16-18. Sec., Dr. J. N. Baker, 519 Dexter Ave. Montgomery.

CALIFORNIA Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California) Los Angeles Dec. 10. Sec., Dr. Charles B. Pinkham 1020 N. St. Sacramento.

CONNECTICUT * Medical Examination Hartford, Nov. 11-12. Endorsement Hartford Nov. 25. Sec., Dr. Creighton Barker, 258 Church St., New Haven. Homopathic Derby, Nov. 11-12. Sec., Dr. Joseph H. Evans, 1488 Chapel St. New Haven.

DELAWARE Dover July 14-16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniell 229 S. State St. Dover.

DISTRICT OF COLUMBIA * Washington, Nov. 10-11. Sec., Dr. George C. Ruhland 6150 East Municipal Bldg., Washington.

FLORIDA * Jacksonville, Nov. 24-25. Sec., Dr. William M. Rowlett, Box 786 Tampa.

HAWAII Honolulu, Jan. 12-15. Sec., Dr. James A. Morgan 48 Young Bldg., Honolulu.

INDIANA Indianapolis June 16-18. Sec., Board of Registration and Examination Dr. J. W. Bowers 301 State House, Indianapolis.

KANSAS Topeka Dec. 9-10. Sec., Board of Medical Registration and Examination, Dr. J. F. Haggis, 905 N. 7th St., Kansas City.

KENTUCKY Louisville, Dec. 8-10. Sec., Dr. A. T. McCormack, 620 S. Third St. Louisville.

MAINE Portland Nov. 12-13. Sec., Board of Registration of Medicine Dr. Adam P. Leighton 129 State St. Portland.

MARYLAND Medical Baltimore Dec. 9-12. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. Homopathic Baltimore, Dec. 9-10. Sec., Dr. John A. Evans 612 W. 40th St., Baltimore.

MISSISSIPPI Reciprocity Jackson, December. Asst. Sec., State Board of Health, Dr. R. V. Whitfield, Jackson.

NEBRASKA * Lincoln Nov. 19-21. Dir., Bureau of Examining Boards Mrs. Jeannette Crawford, 1009 State Capitol Bldg., Lincoln.

NEW HAMPSHIRE Concord March 12-13. Sec., Dr. T. P. Burroughs, Board of Registration in Medicine, State House Concord.

NORTH CAROLINA Endorsement December. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA Grand Forks, Jan. 6-9. Sec., Dr. G. M. Williamson, 41/2 S. Third St. Grand Forks.

OHIO Columbus, Dec. 2-4. Sec., Dr. H. M. Platter, 21 W. Broad St. Columbus.

OILAHOMA * Reciprocity Oklahoma City, Dec. 10. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON Dec. 9-10 and Portland January 21-23. Exec. Sec., Miss Lorraine M. Conlee 608 Fuling Bldg. Portland.

PENNSYLVANIA Philadelphia January. Acting Sec., Bureau of Professional Licensing, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA Columbia Nov. 10-11. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA * Pierre Jan. 13-14. Dir., Medical Licensure, Dr. J. F. D. Cook State Board of Health Pierre.

TEXAS Austin Nov. 17-19. Sec., Dr. T. J. Crowe 918 Texas Bank Bldg., Dallas.

VERMONT Burlington Feb. 10-12. Sec., Board of Medical Registration Dr. F. J. Lyall Richford.

VIRGINIA Richmond Dec. 9-12. Sec., Dr. J. W. Preston, 30 1/2 Franklin Road Roanoke.

WEST VIRGINIA Charleston Nov. 17-19. Sec., Public Health Council, Dr. C. F. McClintic State Capitol Charleston.

WISCONSIN * Madison Jan. 13-15. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA Tucson Dec. 16. Sec., Mr. Franklin E. Roach Science Hall University of Arizona Tucson.

COLORADO Denver, Dec. 10-11. Sec., Dr. Esther B. Starks 1459 Orden St. Denver.

MICHIGAN February 13-14. Sec., Mrs. Flora E. Dube East Lansing.

RHODE ISLAND Providence Nov. 19. Chief Division of Examiners Mr. Thomas B. Casey 66 State Office Bldg. Providence.

SOUTH DAKOTA Aberdeen Dec. 6. Sec., Dr. G. M. Evans Yankton.

WISCONSIN Milwaukee Dec. 6. Sec., Professor Robert A. Bauer, 112 W. Wisconsin Ave. Milwaukee.

Connecticut July Report

The Connecticut State Examining Board reports the written examination for medical licensure held at Hartford, July 8-9, 1941. The examination covered 7 subjects and included 70 questions. An average of 75 per cent was required to pass. Fifty-five candidates were examined, 35 of whom passed and 20 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Yale University School of Medicine	(1941)*		1
University of Louisville School of Medicine	(1941)		1
Johns Hopkins University School of Medicine	(1937)		1
University of Maryland School of Medicine and College of Physicians and Surgeons	(1941)		1
Harvard Medical School (1928)* (1938), (1939), (1940)*			4
Tufts College Medical School (1911), (1940)			2
St. Louis University School of Medicine	(1940)		1
University of Nebraska College of Medicine	(1940)		1
Columbia University College of Physicians and Surgeons (1935)*			7
(1937)* (1939), (1940), (1941), (1941 2)*			2
Cornell University Medical College (1940)* (1941)			7
New York Medical College Flower and Fifth Avenue Hospitals	(1941)*		1
New York University College of Medicine (1938)* (1940)*			3
Jefferson Medical College of Philadelphia	(1933)		1
Marquette University School of Medicine	(1940)		1
Queen's University Faculty of Medicine	(1919)		1
University of Toronto Faculty of Medicine (1928)* (1940)			2
University of Western Ontario Medical School	(1941)		1
McGill University Faculty of Medicine	(1938)		1
Universitat Heidelberg Medizinische Fakultät	(1920)		1
Regia Università degli Studi di Firenze Facoltà di Medicina e Chirurgia	(1926)		1
Universität Bern Medizinische Fakultät	(1937)		1

School	FAILED	Year Grad	Number Failed
Georgetown University School of Medicine	(1941)		1
Tufts College Medical School	(1939)		1
Cornell University Medical College	(1936)		1
Karl Franzens Universität Medizinische Fakultät Graz	(1932)		1
Medizinische Fakultät der Universität Wien (1929), (1930), (1935), (1936 2), (1937, 2)			7
Deutsche Universität Medizinische Fakultät Prag	(1915)		1
Ludwig Maximilians Universität Medizinische Fakultät München (1920)	(1938)		2
Regia Università degli Studi di Bologna Facoltà di Medicina e Chirurgia	(1937)		1
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia	(1937)		1
Regia Università di Napoli Facoltà di Medicina e Chirurgia (1936) (1937) (1938)			3
Osteopathy †			1

Twenty-four physicians were successful in the oral examination held for endorsement applicants at Hartford, July 22. The following schools were represented:

School	PASSED	Year Grad	Endorsement of
Yale University School of Medicine (1930) (1934)* (1938)* (1939) (1940 2), (1940)* N B M Ex			(1937),
Johns Hopkins University School of Medicine (1924)* N B M Ex			
(1933)* Maryland			
Boston University School of Medicine (1936)* N B M Ex			
Harvard Medical School (1921)* Ohio (1932),* (1935)*			
(1939) N B M Ex			
Tufts College Medical School (1939) N B M Ex			
University of Michigan Medical School (1937) Michigan			
St. Louis University School of Medicine (1938)* Tennessee			
New York University College of Medicine (1935)* (1936)*			
(1939) N B M Ex			
University of Buffalo School of Medicine (1939) N B M Ex			
Jefferson Medical College of Philadelphia (1904)* N Carolina			
University of Vermont College of Medicine (1930)* N B M Ex			

* Licenses have not been issued

† Examined in surgery only

Alabama Reciprocity Report

The Alabama State Board of Medical Examiners reports 14 physicians licensed to practice medicine by reciprocity from June 11 through August 29. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Emory University School of Medicine	(1937)		Georgia
University of Louisville School of Medicine (1936), (1940 2)			Kentucky
(1940) Mississippi			
Iowa State University School of Medicine (1939), (1940)			Iowa
Tulane University of Louisiana School of Medicine (1940)			Louisiana
Johns Hopkins University School of Medicine (1926)			Maryland
Harvard Medical School (1935)			Georgia
Cornell University Medical College (1933)			New York
Queen's University Faculty of Medicine (1937) District of Columbia			
McGill University Faculty of Medicine (1937)			Kentucky

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Acts: Suspension of License for Advertising Professional Superiority.—A section of the Business and Professions Code of California authorizes the Board of Dental Examiners to suspend or revoke the license of a dentist guilty of unprofessional conduct, which among other things is defined to include "the advertising of professional superiority or the performance of professional services in a superior manner." Proceedings were instituted against Barron, a licensed dentist, before the board, charging that he had so advertised in that he caused to be published in the Oakland telephone directory an advertisement, which, among other things, stated: "His 'Naturally Beautiful' plates, combined with 'Facial Reconstruction' in designing, makes him Oakland's leading Plate Dentist." After notice and hearing, the board suspended his license and Barron sought a writ of mandate to require the board to set aside its order of suspension. The trial court denied the writ and Barron appealed to the district court of appeal, first district, division 2, California.

Barron alleged that the action of the board constituted an abuse of discretion because the evidence before it was insufficient to indicate that he had made use of any advertising claiming professional superiority. The appellate court, however, found no merit in this contention. It appears entirely clear, said the court, that an advertisement as "Oakland's leading plate dentist" constitutes an advertisement of professional superiority.

Barron next contended that the accusation filed with the board was insufficient to confer jurisdiction on the board in that "the accusation charges in the alternative and not positively and is indefinite, ambiguous, uncertain and unintelligible." This argument was directed at an allegation in the accusation that Barron did advertise "professional superiority or the performance of professional services in a superior manner." We find no merit in this argument, said the court. While so-called alternative pleading is ordinarily condemned, the accusation here was sufficient to confer jurisdiction on the board as no material allegations were alleged in the alternative. The accusation would have been sufficient in this regard if it had charged merely that the petitioner had been guilty of unprofessional conduct as defined in the Business and Professions Code in that Barron had advertised in a certain manner setting forth the advertisement in full.

Barron next contended that the accusation, on which the proceedings before the board was based, was not verified as required by the Business and Professions Code, since it was sworn to before the secretary of the Board of Dental Examiners, who, Barron claimed, was not authorized by law to administer oaths. The court, however, did not deem it necessary to discuss the question as to whether or not the secretary was authorized to administer oaths, since the defect complained of, if any, was waived by Barron by proceeding to a hearing before the board without objection.

Barron next argued that the accusation filed with the board charged a violation of the Business and Professions Code, "which code was not effective as law at the time of the commission of the alleged acts." He claimed that the last act of advertising he had done was the approval of the proof for the advertisement in the directory, which he had done on Aug. 23, 1937, and that the code in question did not become effective until Aug. 27, 1937. It may be pointed out, answered the court, that the advertising was done at Barron's direction in the November 1937 telephone directory but, in any event, the provisions of the Business and Professions Code concerned were merely continuations of previously existing statutory provisions, and Barron was properly charged under the code with acts done prior to Aug. 27, 1937, in violation of the previously existing statutory provisions as continued in the new code.

Finally, Barron contended that the Board of Dental Examiners acted "arbitrarily, capriciously and oppressively" in suspending his license. Even assuming, he argued, that "the alleged offensive advertisement constitutes unprofessional conduct" and that the evidence shows that it was "run or printed in the November 1937 issue of the Oakland Telephone Directory," there is "no affirmative showing that the advertisement was ever brought home to the public and no witness called so testified." We are of the opinion, however, answered the Supreme Court, that the fact that the regular issues of the directory of the telephone company are "brought home to the public" is a matter of such common knowledge that there was no necessity for testimony with respect thereto.

For the reasons stated, the judgment of the lower court dismissing Barron's petition for a writ of mandate was affirmed. —*Barron v. Board of Dental Examiners of State of California* 113 P. 2d, 247 (Calif., 1941).

Records of County Health Commissioner with Respect to Typhoid Carrier Amenable to Court Subpoena.—Marie A. Thomas died of typhoid, allegedly after the bacillus had been transmitted to her by a food handler who conducted a small hotel at which she had been a guest. The food handler, so it was claimed, was to her own knowledge a "typhoid carrier." The decedent's administrator brought suit against the food handler and moved for an order requiring the state health department and the health commissioner of the county in which apparently the food handler resided "to produce . . . such records and papers as might indicate whether or not defendant (food handler) was a typhoid carrier, and, if so, might show what, if any, knowledge defendant had of such condition, and what, if any, information was furnished her by the _____ County or State Health Departments, to the effect that she could transmit the disease to others." The county health commissioner opposed the motion, apparently on the ground that the records of his office were privileged and could not be produced except with the consent of the defendant. The trial court ordered the records produced, but the supreme court, appellate division, second department, New York, on appeal, held that the county health commissioner could not be required to bring the records into court, and the administrator appealed to the Court of Appeals, of New York.

No privilege, said the Court of Appeals, attaches to the records in question of the county health commissioner and the public policy of the state of New York as expressed in the Public Health Law and the Sanitary Code confers no such privilege. Privilege does not exist unless conferred by some statute, and in New York the statutes point the other way and seem to require that such records, so far as they refer to known or suspected typhoid carriers, be made available in a case such as this. The Sanitary Code, which has the force of law, requires local health officers to keep the state department of health informed of the names, ages and addresses of known or suspected typhoid carriers; to furnish the state health department necessary specimens for laboratory examination in such cases; to inform the carrier and members of his household of the situation, and to exercise certain controls over the activities of the carriers, including a prohibition against any handling by the carrier of food which is to be consumed by persons other than members of his own household. Why should the record of compliance by the county health officer with these salutary requirements be kept confidential? Hidden in the files of the health office, it serves no public purpose except a bare statistical one. Made available to those with a legitimate ground for inquiry, it is effective to check the spread of the dread disease. It would be worse than useless to keep secret an order by a public officer that a certain typhoid carrier must not handle foods which are to be served to the public.

The Court of Appeals denied the applicability of section 352 of the Civil Practice Act of New York, which prohibits a physician, except with the consent of his patient, from divulging in court any information which he obtained in attending a patient in a professional capacity and which was necessary to

enable him to act in that capacity. The information in the health commissioner's files, said the Court, concerning the food handler in this case, if there was any such information there, was not acquired by the health commissioner "in attending a patient in a professional capacity" nor was the information "necessary to enable him to act in that capacity." Although the information may have come to the commissioner from a physician in private practice, the transmittal from that physician to the public officer was in obedience to the express command of the Public Health Law. An intention that these records as to communicable diseases should not be kept confidential is found in the history of that law. That law has provided since 1909 as to one of the communicable diseases (tuberculosis) that the report "shall not be divulged or made public." That law was amended in 1939 by naming three other diseases, not including typhoid, as to which the reports should be kept secret. It seems to follow that similar reports as to other communicable diseases are not so privileged.

Accordingly, the Court of Appeals, in effect, ordered the production in the trial of the records asked by the administrator. —*Thomas v. Morris*, 36 N. E. 2d. 141 (N. Y., 1941).

Physical Examination: Right to Compel Submission to Cystoscopic Examination.—As part of a physical examination before trial, the defendants sought to compel the plaintiff to submit to a cystoscopic examination. From an order denying that right, the defendants appealed to the New York supreme court, appellate division, fourth department.

The plaintiff's evidence indicated that a cystoscopic examination is "a major operation . . . most painful . . . (and) has been known to cause death." The defendants, however, submitted the affidavit of a medical expert stating that he had never heard of such an examination from which there had "been any very harmful, serious or fatal results . . . nor . . . a fatality resulting simply from a cystoscopic examination." The affidavit further stated that such an examination "cannot be compared . . . in seriousness with a major operation." The appellate division said that while persons had been compelled to submit to a roentgen examination and to the taking of a few drops of blood, the court had refused to compel a plaintiff to submit to certain exercises and breathing tests or to eat barium meal to assist in obtaining a roentgenogram of the stomach. In the opinion of the court, the defendants' request was asking it to go much further than it had gone before in subjecting a person to physical pain and danger to health. The defendants' request for a cystoscopic examination was denied, as was also a motion for leave to appeal to the Court of Appeals.—*Carrig v. Oakes*, 18 N. Y. S. (2d) 917; 18 N. Y. S. (2d) 918 (N. Y., 1940).

Society Proceedings

COMING MEETINGS

- American Society of Tropical Medicine, St. Louis, Nov. 11-14. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
Annual Conference of Secretaries of Constituent State Medical Associations, Chicago, Nov. 14-15. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.
National Society for the Prevention of Blindness, New York, Dec. 4-6. Mrs. Eleanor Brown Merrill, 1790 Broadway, New York, Executive Director.
Puerto Rico, Medical Association of, Santurce, Dec. 11-14. Dr. David E. Garcia, P. O. Box 3866, Santurce, Secretary.
Radiological Society of North America, San Francisco, Dec. 1-5. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
Society for the Study of Asthma and Allied Conditions, New York, Dec. 6. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
Society of American Bacteriologists, Baltimore, Dec. 29-31. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
Southern Medical Association, St. Louis, Nov. 10-13. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.
Southern Surgical Association, Pinehurst, N. C., Dec. 9-11. Dr. E. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
Southwestern Medical Association, El Paso, Texas, Nov. 20-22. Dr. Louis W. Breck, 116 Mills St., El Paso, Secretary.
Western Surgical Association, St. Paul, Dec. 5-6. Dr. Arthur R. Metz, 2449 Washington Blvd., Chicago, Secretary.

THE AMERICAN RHEUMATISM ASSOCIATION

Eighth Annual Meeting, held in Cleveland, June 2, 1941

DR. A. R. SHANDS JR., Wilmington, Del., Secretary

(Concluded from page 1566)

Cytologic Study of Synovial Tissue in Various Types of Arthritis

DRS. CURRIER McEWEN, ERNST W. BERGMANN and HARRY MOST, New York: Our purpose in this study was to apply the supravital method of staining to the examination of synovial tissue removed at operation in the manner previously employed in studies of rheumatic and rheumatoid subcutaneous nodules (*J. Exper. Med.* 55:745 [May] 1932; *Arch. Path.* 25:303 [March] 1938).

The findings in the various types of disease studied were as follows:

Tuberculous Arthritis: In 10 of the 13 synovial tissues from active human cases, typical epithelioid cells were found. The total number of cells was moderate to large. Besides epithelioids, small and medium sized fixed tissue cells like those previously described for rheumatic and rheumatoid subcutaneous nodules were found in every case, small and medium lymphocytes in all but 1 and monocytes, clasmatocytes and neutrophils in all but 3. Two patients with clinically and pathologically healed joint tuberculosis showed but few cells and no epithelioids. Eight examples of tuberculous arthritis in rabbits gave results identical with those of the active human cases except that epithelioid cells were more numerous.

Rheumatoid Arthritis: One healed joint gave findings like those of the healed tuberculous ones. In 6 active cases, cells were numerous and predominantly of the medium sized and large fixed tissue type. Clasmatocytes, lymphocytes and neutrophils occurred in proportions similar to those of the tuberculous tissues. In general, the cells were like those found previously in scrapings of rheumatic and rheumatoid subcutaneous nodules.

Traumatic Joint Disturbances: Five cases of some chronicity showed a moderate number of cells consisting predominantly of small fixed tissue cells with smaller numbers of medium sized fixed tissue cells, neutrophils, lymphocytes and clasmatocytes. Two showed a very few unstimulated monocytes.

Synovitis of Unknown Cause: In 3 cases of this kind, findings were similar to those in rheumatoid arthritis.

Miscellaneous: Study was made of 2 essentially normal joints (old poliomyelitis cases), an uncomplicated osteoarthritic joint and a Charcot joint. In all, the cells were extremely few in number and consisted of small fixed tissue cells, neutrophils and small lymphocytes.

These results are consistent with previous studies on rheumatoid subcutaneous nodules and tuberculous tissues and give further support to the view that the medium sized and large fixed tissue cells are indeed the "characteristic" cells of rheumatic and rheumatoid lesions.

Whether studies of this type carried out at the time of operation would be of value to the surgeon in deciding whether to do synovectomy or arthrodesis is not yet clear. When present in good numbers, epithelioid cells were found in five to ten minutes of search, but how supravital examination would compare with frozen sections in speed and accuracy has not been tested. Furthermore, although epithelioid cells were found in none but tuberculous synovial tissues they were not found in all the tuberculous cases. Actually, we believe that the finding of definite epithelioid cells would warrant a diagnosis of active tuberculous arthritis but that a lack of them would not exclude tuberculosis.

DISCUSSION

DR. GRANVILLE A. BENNETT, Boston: In his previous investigations of subcutaneous nodules with the aid of supravital technic, Dr. McEwen was dealing with a tissue reaction which constitutes, in my opinion, the most characteristic single lesion in rheumatoid arthritis. The present study is concerned with tissues which, although differing morphologically and perhaps functionally in the various portions of the joints, are all con-

nective tissue derivatives. It has been demonstrated in microscopic sections that these tissues respond to injury in a manner similar to the other connective tissues of the body. The reaction elicited in synovial tissues by a given inflammatory irritant is a complicated cellular and vascular process as it is in other connective tissues. Since in the interpretation of a lesion the pathologist is frequently forced to depend as much on its grosser structure as on its cellular components, one might anticipate that diagnosis from purely cytologic studies of synovial tissues would be difficult and frequently impossible. In our laboratory we have examined microscopically the joint tissues, in more than 1,000 cases of joint disease. Included in this group were 125 surgically treated and 30 cases of rheumatoid arthritis examined post mortem. It has been our experience that one's ability to distinguish different forms of arthritis on the basis of the synovial tissue changes alone is limited. In rheumatoid arthritis the synovia shows a chronic inflammatory reaction which frequently contains no diagnostic features. The presence of focal collections of lymphoid cells with or without germinal centers, although frequently observed in rheumatoid arthritis, has not, in our experience, been limited to this disease. The presence of "fibrinoid" deposits on or within the synovial tissues has likewise not proved to be a disease-specific finding. As a result of these and other observations, we have been forced, in reporting our pathologic findings on tissues removed from the joints of rheumatoid arthritis patients, to return a diagnosis of "chronic synovitis." In certain instances we may feel justified in adding "consistent with rheumatoid arthritis." In the diagnosis of tuberculosis the pathologist must depend on the grosser structure of the lesion and the presence of caseation necrosis as well as on the cytologic features of the lesion. It would seem probable that the study of frozen sections of synovial tissues would again give more conclusive results in diagnosis than would an examination by supravital technic of cellular scrapings. It should be pointed out that tubercles or tuberculous granulation tissue in the synovia may be entirely covered by a formless caseating mass. In such instances it is only by the examination of the deeper portions of sections cut in a plane vertical to the lining surface of the joint that one is able to detect the characteristic lesions. I have frequently observed small or medium sized multinucleated giant cells in the fixed tissue sections of the synovia of rheumatoid arthritis patients. If Dr. McEwen has observed these same cells in his preparations of synovia from rheumatoid patients, I should like to hear how they compare with giant cells he has observed in other lesions, especially in tuberculosis.

DR. WALTER BAUER, Boston: My experience with the supravital technic as a diagnostic aid has been limited to cytologic examinations of normal and pathologic synovial fluids. Although the supravital technic allows for more accurate identification of the various types of mononuclear phagocytes than any fixed stain preparations, the latter method suffices for cytologic examination of most pathologic effusions. The diagnosis of joint disease is not possible if one relies solely on cytologic studies of the synovial fluid. If, however, one observes also the appearance, presence or absence of clot, viscosity, total protein, globulin, mucin and sugar contents, the examination of synovial fluids will be found to be of diagnostic aid. Largely through the efforts of Drs. M. W. Ropes and H. C. Coggeshall, such detailed examinations of 750 fluids from various types of joint disease have been made. Analyses of these data indicate that the majority of the fluids can be separated into two groups. Group 1 fluids are essentially traumatic in nature (traumatic arthritis, degenerative joint disease, Charcot joints and osteochondromatosis). Group 2 includes those obtained from specific infectious arthritides of known origin and rheumatoid arthritis. Most group 1 fluids are clear and do not clot, whereas group 2 fluids may be clear or turbid and usually do clot. Total leukocyte counts above 1,000 are rarely encountered in group 1 fluids, whereas in group 2 they are generally 3,000 or higher. The polymorphonuclears are less than 500 in group 1 and ordinarily greater than 1,000 in group 2. The protein concentration is less than 5.2 Gm. per hundred cubic centimeters in group 1

but varies from 3.0 to 8.9 Gm. in group 2. The changes in the globulin fraction are most significant. The mucin concentration is usually lower in group 2, but more important than the concentration are its precipitability with acetic acid and the viscosity of the fluid. The mucin precipitate from group 1 fluids is ropy and the solution clear, while the precipitate from group 2 fluids is usually friable and the solution cloudy. Group 1 fluids usually show only a moderate reduction of viscosity as compared to a definite reduction in most group 2 fluids. In group 1 the serum fluid fasting sugar difference is usually normal (less than 10 mg. per hundred cubic centimeters) in contrast to a much greater difference in the majority of group 2 fluids. To summarize, aspiration of a turbid fluid which clots and has a low viscosity, a total leukocyte count above 3,000 with absolute polymorphonuclear count above 500, a protein content above 5.0 Gm. per hundred cubic centimeters and a serum-fluid sugar difference of over 20 mg. per hundred cubic centimeters indicates that the joint disease is not in group 1. Results in individual cases have shown that examination of joint fluid used in conjunction with history, physical examination and other laboratory tests is of definite diagnostic and prognostic value.

DR. CURRIER MCEWEN, New York: I did not mean to imply that supravital studies of this kind would be of any great help in making a diagnosis of rheumatoid arthritis, since the cells one finds in the rheumatoid tissues are present also in other types of lesions. I do believe, however, that the presence of typical epithelioid cells would warrant a diagnosis of tuberculous arthritis. To be sure, Florence Sabin and Cunningham and others have found that the injection of certain lipids into tissues leads to the formation of epithelioid cells, but from the practical clinical standpoint I believe the finding of epithelioid cells in synovial tissue would warrant a diagnosis of tuberculosis and the exclusion of rheumatoid arthritis or other diseases which might give the same gross appearance clinically and at operation. I want to emphasize that these studies which I have reported were based on examination of individual cells supravitaly stained and not on the usual tissue sections prepared by the ordinary histologic technic. We did make histologic studies, of course, and from study of them I agree with Dr. Bennett that the collections of lymphoid cells are not pathognomonic of rheumatoid arthritis. Dr. Bennett inquired about the giant cell illustrated in one of the lantern slides. That cell was not from synovial membrane but from a scraping of a rheumatic subcutaneous nodule made in 1932. I believe it represents the kind of giant cell that characterizes the Aschoff body. We have found similar cells in scrapings of rheumatoid nodules and synovial granulations but none with more than three nuclei. As to Dr. Bauer's statement I would again call attention to the fact that I was reporting studies made on scrapings of tissues and not on fluids. We have in a good many cases obtained samples of fluid before the joint capsule was opened and compared these with the tissue scrapings. The types of cells found in the fluid and tissues were different even in the same joint. I agree with Dr. Bauer that the supravital method of staining has no special advantage over the Wright method for the routine staining of synovial fluids. One will probably do better with whichever method one knows best. But for the study of individual tissue cells the supravital method is better technically and also gives more information. I would go even further than Dr. Bauer, however, and say that I doubt whether the examination of synovial fluid gives much information of value in diagnosis beyond that which one gets from the gross appearance, bacteriologic culture and guinea pig inoculation. If one carries out cytologic studies on synovial fluids from 100 patients each with rheumatic fever, rheumatoid arthritis and gonococcal arthritis, one will find different trends in the three groups; but individuals in each group will overlap. I believe that the collection of data in these fluids is important for research purposes, but I doubt that they will be found sufficiently useful to be adopted as routine clinical tests. This conclusion is drawn only from cytologic examination of the fluids, however, for I have not done all the other types of study included in Dr. Bauer's analysis.

The Liver an Etiologic and Therapeutic Factor in Certain Types of Blood Disease and in Gout and Gouty Arthritis

DR. JOHN STAIGE DAVIS JR., New York: I report 21 cases of blood dyscrasias associated with symptoms of either rheumatoid arthritis or gout. One of these cases was fibrositis, 1 was acute rheumatic fever and 3 were both rheumatoid arthritis and gout. The signs and symptoms of both diseases were classic. The observation of these 21 associated cases in the short time of two years would seem to lend further evidence to the reported relation of liver disease to arthritis, provided one accepts the theory that severe diseases of the blood are accompanied by liver change.

Four of the patients with hemolytic icterus had their spleens removed; one recovered completely from his gout, 1 died from postoperative pneumonia, although her gout had disappeared, 1 recovered from fibrositis and the fourth has had no more attacks of rheumatic fever. Of the remaining 3, 1 has shown no improvement in generous administration of concentrated liver and vitamins, while another was given full complement liver but was unable to tolerate it, and the third was given large doses of full complement liver.

One man had his spleen removed through an error in diagnosis. On operation his splenomegaly was found to be of syphilitic origin.

The full complement liver was used for four reasons: 1. These patients were quite anemic, and liver therapy was indicated for supportive therapy. 2. Concentrated liver for the most part had been ineffective in the treatment of both arthritis and gout. Furthermore, cases of gout have been known to be precipitated by concentrated liver administration. 3. It was thought that there might be some deficiency in a particular fraction of the liver in either one or both of these diseases, which substance might be removed in concentrating the liver fraction. It was therefore decided to use as complete a fraction as possible. Also, since the useful fraction might probably be present in minute quantities, it was deemed necessary to use rather large doses. 4. Concentrated liver is high in the hemopoietic fraction; it would therefore be more apt to cause rapid maturation of the red cells with accompanying extrusion of the nuclei and thus an attack of gout might be provoked.

The liver fraction which we have found to be most useful is marketed under the trade name of Campolon. It differs from the other available liver extracts not only as a result of its low potency but also because it is not heated in preparation. Both purine and protein are removed. This preparation has been given to a series of 25 patients with gout and the results have been favorable. It is no better than colchicine in acute attacks and in some cases not so dramatic. Its effects, however, are more lasting. The average effect on the uric acid in 16 of these cases will be reported at a later date.

It is well understood that in attempting to evaluate any treatment of acute gout one is treading on dangerous ground. Nevertheless the favorable results obtained with chronic gout shown here present at least a new method of approach to the understanding of the disease.

The results in rheumatoid arthritis have been disappointing, although a few cases have been dramatic.

Twenty-one cases of blood disease accompanied by various arthritic states support the hypothesis of the association of arthritis and liver disease. The beneficial effects of full complement liver extract on certain of these patients, particularly those with gouty arthritis, suggests that gout is a deficiency disease. Two patients with gout, 1 with fibrositis and 1 with rheumatic fever associated with hemolytic icterus, recovered following splenectomy.

DISCUSSION

DR. E. F. HARTUNG, New York: Dr. Davis has hypothesized liver damage in gout and rheumatoid arthritis as a possible factor in their etiology. He bases this on four observations: (1) the relationship of blood dyscrasias to rheumatoid arthritis and gout, (2) the observation of gout and rheumatoid arthritis in the same patient, (3) the observation that splenectomy in some blood dyscrasias results in the disappearance of

the symptoms of gout, and (4) the observation that a full complement liver extract has had beneficial effects in some cases of gout. If a much larger series of cases bears out these relationships, his observations will assume great importance. As to observation 4, I have used Campolon in gout both between and during attacks and have not yet made up my mind as to the therapeutic effect. I have seen some of Dr. Davis's own cases in which the effect appeared to be beneficial. The whole theory of hormones of liver or kidney origin is interesting in relationship to the causation of gout. In order to study the problem of gout, there are five points that I think are important:

1. A restudy of the microscopic anatomy of the liver in gout.
2. An independent conclusion as to the validity of liver function tests and the application of these in cases of gout. There are so many questionable reports on liver function tests that I think the field has to be cleared from the point of view of liver function tests in themselves before one can draw any conclusions as to their value in rheumatoid disease.
3. The pharmacology of colchicum. It seems to me that a complete understanding of its mode of action would lead to a clarification of the mechanism of gout.
4. The study of the various components of the blood from the point of view of uric acid content, whole blood, plasma, serum and cells.
5. A study of other tissue-extracted hormones besides uricase, such as nucleosidase.

DR. C. H. SLOCUMB, Rochester, Minn.: The effects of concentrated liver extract and a special purine free liver extract have been studied in a few cases of gout at our clinic. On three occasions a purine free liver extract was given by mouth and in each case from twenty-four to forty-eight hours after starting it fever and general malaise developed and in 2 cases acute attacks of gouty arthritis occurred. The presence of the systemic reaction made studies of the level of uric acid in the blood and of the urinary excretion of uric acid unreliable and variable. One patient who had pernicious anemia and gout complained that when he took liver for the control of the pernicious anemia his gouty arthritis recurred and when he did not take liver he did not have gouty arthritis. Our experience at the clinic is that the liver extracts that we have used always have made gout worse. We have not used Campolon for patients with gout as Dr. Davis has. I cannot yet understand why the action of crude liver extract (Campolon) is different from the more refined products.

DR. W. B. RAWLS, New York: During the past two years, I have been studying all cases of gout with particular reference to intake and have noted that about 75 per cent of these cases are not due to excessive intake of food or alcoholic beverages and that, as a rule, underweight exists and frequently there is liver dysfunction. I believe that this group of patients constitutes a separate clinical entity from the usually accepted case of gout and that there are causative factors other than excessive intake of food. For example, a South American patient 5 feet 6 inches (168 cm.) tall and weighing 128 pounds (58 Kg.) had been treated in clinics in France, Germany and England for recurrent attacks of gout, which usually appeared several times each year. This patient had originally been given the old arsphenamine preparations for syphilitic infection. When I first saw him he had a plasma uric acid of 7.0 mg. per hundred cubic centimeters, secondary anemia with a color index above 1 and a liver function test of 48 per cent by the hippuric acid test. The administration of ferrous sulfate and liver, given separately, failed to correct the anemia, but when the two were given together a normal blood count was obtained. With this routine and measures to improve the liver function there was cessation of his symptoms of gout and it has now been eighteen months since his last attack, the longest symptom free period in over six years. His uric acid remains about 4 mg. per hundred cubic centimeters and his liver function varies between 65 and 88 per cent by the hippuric acid test. I do not know whether liver function plays a part in these cases, but disorders of liver function occur frequently in the type of case described, which is, I believe, a clinical entity different than the usual form of gout and requires different treatment. I have not used Campolon in the doses described by Dr. Davis but only as an adjunct in combating the anemia present and raising the general resistance of the patient.

DR. L. MAXWELL LOCKIE, Buffalo: I feel that some of the benefit described by Dr. Davis may come about as a result of the specific effect of liver to maintain a proper blood level in the patient with pernicious anemia, thus preventing excessive blood cell destruction or regeneration. Symptoms characteristic of gouty arthritis and controlled by appropriate measures do occur during exacerbations and remissions of pernicious anemia as well as in cases of leukemia when excessive cellular destruction goes on. During these periods relatively large amounts of "nuclear" material are released from the red blood cells or from the white blood cells. If severe neuritic pain occurs during such a time, usually it can be controlled by adequate doses of colchicine.

DR. JOHN STAIGE DAVIS JR., New York: Dr. Lockie has suggested that patients with gout felt better on the liver therapy because of the general effect which they received. There was no specific action. It seemed to me to be of a more specific nature, as the more concentrated livers and the other unconcentrated livers did not produce the same effect. I feel that it in some way interferes with the formation of uric acid and that therefore less is formed.

Fractures in Chronic Arthritis

DR. GEORGE J. BAER, Boston: The incidence of fractures in chronic arthritis, the rate of healing and the complications following fractures have been studied in 1,625 case records of arthritis at the Robert Breck Brigham Hospital. The records examined included the disease in all its accepted classifications. Fractures occurred twenty-one times, or in 1.2 per cent of the cases. At times it was difficult to differentiate a fracture from "disintegration" at the bone ends due to atrophy and cystic degeneration. If such disintegrations were considered as fractures, the incidence of fractures in chronic arthritis would be increased. Such "infractures," as they have been described by Knaggs, have not been classified as fractures in this survey. A fracture to be classified had to satisfy the criteria commonly accepted by all surgical textbooks.

One would expect fractures to be common in patients with rheumatoid arthritis because of the severe bone atrophy, loss of lime salts, cystic degeneration of bone and loss of muscle tone. However, these patients, because of the loss of joint function, pain and muscular weakness, lead a rather guarded existence, so that the forces necessary to produce a fracture are infrequently encountered.

In 21 cases of fractures, 14 of them occurred in rheumatoid arthritis. They were all produced by minor trauma except for 5 produced by manipulation of a joint under anesthesia. Simple fractures were encountered most frequently; there were no compound fractures. In each instance there was bone atrophy, which was minimal in 4 cases and severe in 10 cases. Following the healing of a fracture, the bone atrophy persisted in all parts of the bone except about the fracture site, where the newly calcified callus was conspicuous by its density. Union took place in all cases and proceeded normally except in 1 case—a fracture of the midshaft of the femur, in which union was delayed.

In 8 cases the sedimentation rate was elevated at the time the fracture was sustained. The fact that a fracture occurred did not alter the course of the active arthritis, nor was there a generalized or localized exacerbation in the quiescent cases.

One fracture was found in a patient with gonococcal arthritis. The disease had been present six weeks when a Colles fracture was sustained. The wrist joint had been involved in the generalized gonococcal arthritis, there was slight bone atrophy and healing took place in six weeks.

There were 6 patients with fracture in osteoarthritis, 4 women and 2 men. All these patients were in or past the sixth decade of life. A simple fracture was the most common and there were no compound fractures encountered. All these were the result of major trauma. Firm union took place in all cases in normal time. Atrophy of the fractured bones was not noted in 4 cases and was minimal in 2 cases. The sedimentation rate was elevated in 2 of the cases and not determined in the others. Fractures did not alter the arthritic process.

Since this material has been compiled, three fractures in patients with rheumatoid arthritis have been observed within one month. All are progressing normally.

It must be emphasized that, when a fracture occurs in a limb with joints involved by arthritis, immobilization in a plaster cast is justified only long enough to allow a sufficient callus to form to hold the fragments in good alignment. The cast must then be removed and the limb immobilized in a splint so arranged that passive motion of the affected joint can be easily accomplished to prevent ankylosis or extensive limitation of motion.

It is quite likely that fractures in chronic arthritis are more common than the figures in this survey would indicate. Once the possibility is recognized and a more careful search made for fractures, future surveys should reveal a higher percentage of cases.

DISCUSSION

DR. J. ALBERT KEY, St. Louis: I would expect fractures to be more frequent than dislocations in rheumatoid arthritis because the joints are stiff and the bones are weak, and I would expect to find all fractures to be infrequent among persons whose activity is restricted. On the other hand, it does not take much force to break an atrophic bone. I was interested in the statement that there was no alteration in the course of the disease as a result of the fracture. A few years ago Colin McKenzie had the experience of having a patient with severe arthritis sustain a traumatic fracture of the hip. As the hip healed the arthritis got well. He drilled large holes in the metaphysis of bones, especially around arthritic knees, and curetted out the fatty material and reported excellent results in several patients. I think some similar operations were done at the Mayo Clinic. Fractures in patients with osteoarthritis are relatively common because certain fractures occur in old persons. Most people who break their wrists or hips are beyond middle age. Those people are treated as though they were normal individuals. In treating fractures in patients with osteoarthritis there is little danger of stiffness of the joints and it is advisable to continue the immobilization longer than usual. It has been my experience that atrophic bone heals more rapidly than normal bone because the rate of healing varies inversely with the density of the bone.

DR. LORING T. SWAIM, Boston: This paper brings up questions about conditions present in the atrophic bone. Several of these fractures of the lower end of the femur were produced with no greater power than the hands during manipulation. There was no sense of breaking. The bone seemed so soft that it just crushed together above the condyles. Yet in spite of this softness the calluses healed normally and rapidly and were as strong afterward as the normal bone. The reason these bones crushed so easily was that the adhesions and thickened fibrous capsule in the back of the knee was stronger than the atrophic bone, and the bone gave before the adhesions would break or stretch. Manipulation is a procedure to be done with caution, because fracture may take place. It is also found that, in osteotomies, arthroplasties and other operations on arthritic bones, healing occurred as rapidly and normally as in people who do not have arthritis. In spite of the softness of these bones and the decalcification, they do not seem to fracture frequently. There were no ununited fractures in any of these cases even when the bone appeared extremely atrophic, nor did the activity of the disease seem to have any effect on it. I have found no explanation of it except that the arthritis does not seem to affect the ability of the periosteum to lay down bone for callus to form or for the bone to repair. Pathologists may be able to answer this question and thus give us more information as to why arthritis does not affect the healing power of the bone. Twenty years ago we operated on arthritic bones with some fear. This has entirely gone now.

DR. GEORGE J. BAER, Boston: It is obvious that in osteoarthritis or degenerative joint disease fractures are more common. At Peter Bent Brigham Hospital we see only those cases which have symptoms. The 5 cases that I have seen recently have all been in hips and it is difficult to be sure they are healing. The oldest one has gone five months, and I hesitate to say whether it has gone faster than the other hips we have nailed.

Oral Stilbestrol Therapy in Menopause Arthritis

DR WILLIAM K ISHMAEL, Oklahoma City The term "menopause arthritis" is applied to that group of cases in which the symptoms appear during or soon after the natural or artificial menopause. One hundred and seventeen patients having rheumatic symptoms which were concurrent with other manifestations referable to the menopause and which existed only since the onset of the menopause were carefully selected. Each patient was given, on an average, 1 mg of stilbestrol by mouth every three days. The frequency of administration and the dose of the drug were altered in many patients. "Supportive" measures consisted of the usual indicated dietary regimen, rest, avoidance of traumatic factors, correction of metabolic and other endocrine dyscrasia, physical therapy measures and ordinary orthopedic support. When and if complete relief of symptoms occurred the stilbestrol was withdrawn, the other measures of treatment being continued. When and if symptoms reappeared, the stilbestrol was resumed. The patients were not advised as to the nature of the tablets.

As control, the natural estrogenic substance was administered orally to 34 patients, 0.12 mg daily. As further control 178 patients having "other symptoms" of the menopause were placed on oral stilbestrol therapy with the same routine of dosage. Note should be made that in the latter control group the use of any "supportive" measures was carefully avoided. This group was under the direction of Dr Owen Royce.

It was found that 79 per cent of those patients diagnosed as having menopause arthritis had complete relief of their symptoms from the stilbestrol tablets combined with the "supportive" measures. When the tablets were discontinued around 80 per cent of this group had return of symptoms in an average of twenty-one days. After resuming the stilbestrol, around 97 per cent again became pain free and remained so as long as the drug was continued. These figures must be considered cautiously. The psychic factors and the natural tendency for remission and flare-up make it almost impossible to evaluate their reactions accurately. Nineteen per cent of the group receiving the oral stilbestrol together with "supportive" measures were improved and 2 per cent failed to respond in any degree. This compares favorably with the 80 per cent remissions from the parenteral administration of stilbestrol previously reported.

Of the control group, in those receiving the natural estrogenic hormone orally 30 per cent had complete relief of symptoms, 35 per cent were "improved" and 35 per cent had no degree of relief. This control group received the same "supportive" measures as those receiving the stilbestrol. The failure of this group to respond was most likely the result of inadequate concentration in the blood stream.

In the third group, classed as having "other symptoms" of the menopause, 37 per cent had complete relief of symptoms, 60 per cent were improved and only 3 per cent failed to improve. It should be recalled that treatment other than stilbestrol was carefully avoided in this group, whereas in the arthritic group supportive measures were encouraged.

In regard to the toxic or unpleasant side effects, 17 per cent complained at some time during the period of observation. Nausea was by far the most prevalent complaint. This occasionally was accompanied by vomiting and abdominal cramping. One patient developed a mass in her breast during the course of therapy, which was revealed to be a benign cyst by microscopic examination. Of those who complained of gastrointestinal symptoms all but 6 patients were able to resume the drug when an enteric coated tablet was used and the dose restricted to 1 mg or below. Not one of the gastrointestinal symptoms exhibited by those patients was more than unpleasant except in those 6 patients, among whom it was finally discontinued.

These facts if later substantiated by other investigators, add evidence that a lowered amount or absence of the estrogenic hormone is capable of producing by some means rheumatic disease.

In spite of the fact that stilbestrol when given orally controls the symptoms among a comparatively large group of patients suffering from menopausal arthritis and that this drug offers a substantial reduction in the cost of treatment for these patients, one is necessarily cautious in recommending its commercial

availability when one thinks of a woman entering a pharmacy and blandly ordering a dozen stilbestrol tablets for her aching knees or hot flashes when possibly there exists in her breast or cervix a malignant carcinoma.

DISCUSSION

DR C H SLOCUMB, Rochester, Minn Stilbene derivatives do not produce the same results in treating rheumatoid arthritis as those obtained in climacteric arthralgia. Most of the patients with rheumatoid arthritis who have been given theelin or stilbestrol at our clinic noticed no effect on their arthritis, although 2 patients did notice improvement. One patient was given large doses of theelin with marked subjective and objective improvement in her arthritis during a two months period. Within a week after the administration of theelin was stopped, the rheumatoid arthritis was worse. This same cycle of improvement during treatment and return of symptoms after stopping the injection of theelin was repeated during a second series of injections. The other patient had considerable relief of symptoms during pregnancy, but following delivery her rheumatoid arthritis became much worse. Stilbestrol was then given in a dosage of 0.5 mg daily, during which time she noticed definite relief of symptoms from the arthritis. When the stilbestrol was stopped the arthritis again became worse. I am much interested in Dr Ishmael's report that the stilbene derivatives have much better effect on the climacteric arthralgias than we have seen in rheumatoid arthritis.

DR RUSSELL L CECIL, New York I cannot understand why some question has been raised as to the propriety of speaking of menopausal arthritis. I do not see why there is any objection to using the term menopausal arthritis or arthralgia. We see it frequently in young women who have had a hysterectomy and are otherwise perfectly healthy. Following hysterectomy they develop pain in the muscles and joints with no other symptoms and if we do not call it postmenopausal arthralgia I do not know what else to call it.

DR J ALBERT KEY, St Louis I am impressed with the fact that patients with so called degenerative joint disease for years, stiffness in their joints so they wake up in the morning with fingers feeling tight and swollen are amenable to therapy with the hormones. The more one studies these cases the more is one impressed with the endocrine factor in the production of symptoms and the analogy of the so called degenerative joint disease. I believe it is the most important factor we have to deal with in the handling of these patients.

DR S J LANG, Evanston, Ill The stilbene derivatives are unquestionably superior to other oral preparations for the control of menopausal symptoms. Joint pains arising during menopause are at times relieved by the use of estrogenic substances. There is, however, considerable doubt that any of these preparations operate in a specific manner. It is much more likely that they lessen the hyperesthesia and the hypersensitivity which often accompany the menopausal period. I have used stilbene derivatives (stilbestrol) in a few cases of climacteric arthralgia and find them as effective in relieving the symptoms as are the estrogenic preparations used parenterally.

DR H M MARGOLIS, Pittsburg Have any toxic reactions from the use of stilbestrol been observed?

DR WILLIAM K ISHMAEL, Oklahoma City To answer Dr Margolis, toxic reaction is probably the chief objection to this drug. Seventeen per cent complained of nausea. Later we were able to obtain an enteric coated tablet and then only 6 patients in the entire 117 were unable to tolerate it. One breast tumor developed during treatment, which was found to be benign on biopsy. Of the 6 that did not tolerate the drug 2 did not respond to therapy and were quite ill. Salle reported that in mice death would occur if the doses were carried too high. We must be very careful in its use. I agree that stilbestrol is no better than the natural hormones. Its advantage is that it can be given by mouth and is comparatively inexpensive. Apparently this drug is purely replacement therapy. I have no idea how long it should be continued. I have used it only two years. Many times the patients were older people whose joint pains have come on since the menopause. If it can help in the prevention of degenerative joints it may be of some value.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

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*Intrathoracic Manifestations of Lymphomatoid Diseases. J. O. Vieta and L. F. Craver, New York.—p. 138.
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Accuracy of Focal Spot Size Determination. Some Theoretical and Practical Considerations. L. G. Jacobs, Indianapolis.—p. 214.
Evolution of Dosimeters in Roentgen Ray Therapy. O. Glasser, Cleveland.—p. 221.

Mediastinal and Pulmonary Changes in Erythema Nodosum.—According to Paul and Pohle, roentgenograms of the chest were had of 20 of 42 patients with a diagnosis of erythema nodosum. Only 1 of the 20 patients was a child. The roentgenograms of 8 were entirely negative for evidence of past or present disease; those of the remaining 12 presented varying degrees of pathologic change. In 1 there was an apical pleural cap with a minimal amount of subpleural parenchymal density. Another patient had typical erythema nodosum in 1932. Roentgenograms were not made at that time. Two years later a tuberculous pleural effusion was followed by parenchymal lesions and positive sputum. The patient received active treatment and at the last report, one and a half years ago, the disease was still active. No roentgenograms were taken at the time of the erythema nodosum, and one can only speculate as to its bearing on the later development of active tuberculosis.

It is possible that the erythema nodosum represented the development of allergy to tuberculo-protein and that the pleural and parenchymal tuberculosis was of the reinfection type. The roentgenograms of 1 patient showed only an apical pleural scar. Those of the remaining 9 presented varying degrees of lymphadenopathy of the hilus. Of these 9, 3 had slight but definite degrees of enlargement of the hilus of nodular type and 6 showed moderate to pronounced changes in the shadows of the hilus. From a roentgenologic point of view these patients offered a problem in differential diagnosis. In every instance the primary diagnosis was erythema nodosum and in some the mediastinal changes were not suspected clinically. In only 2 patients was it possible to establish proof of the tuberculous nature of the adenopathy. It is probable that all of them belonged in this category. Lymphoblastoma was the tentative diagnosis in 2 and improvement followed test doses of high voltage roentgen therapy. The patients demonstrate the difficulty of distinguishing between inflammatory and neoplastic mediastinal masses. The coexistence of mediastinal enlargement and enlargement of the hilus or recent erythema nodosum should suggest the nature of the adenopathy, since even in adults such a combination is most likely to be of tuberculous origin. When roentgenograms of the chest of a patient with erythema nodosum reveal adenopathy of the hilus, the tuberculous etiology of the former can be surmised (except in patients who live in areas in which coccidioidomycosis is prevalent). Therefore roentgenograms of the chest should be made of all patients with erythema nodosum and, even if they are negative, follow-up examinations should be done before the patient is considered to be free from tuberculosis. The knowledge that a patient with nodular enlargement of the hilus and mediastinal nodes has or has had an associated erythema nodosum may make an otherwise difficult diagnosis easier.

Intrathoracic Manifestations of Lymphomatoid Diseases.—Vieta and Craver call attention to the frequency of intrathoracic manifestations of lymphomatoid diseases, particularly of lesions other than the ordinary adenopathies of the hilus or mediastinum. A survey of all the cases with proved pathologic diagnoses seen in the Memorial Hospital from 1917 to 1940, excluding cases lost to follow-up, without roentgenograms of the chest or confirming biopsies, leaves 794 cases with acceptable roentgen and 160 with acceptable postmortem observations. The necropsy material reveals a much higher incidence of intrathoracic lesions than do the roentgenograms. This discrepancy might be reduced by more frequent roentgen studies. In the roentgen analysis of 335 instances of Hodgkin's disease intrathoracic lesions were demonstrated in 74 per cent: the parenchyma was involved in 38.5, the pleura in 7.4 and pleural exudate in 15.8 per cent. At necropsy lesions within the thorax were demonstrated in 88 per cent: the mediastinum or nodes of the hilus were involved in 74, the parenchyma in 47 and the parietal pleura in 29 per cent. Of 239 cases of lymphosarcoma analyzed roentgenographically, 54 per cent showed intrathoracic involvement, 24 of the lung, 10 a thickened pleura and 16.6 per cent pleural effusion. At necropsy in lymphosarcoma enlargement of the nodes of the mediastinum and/or hilus may be expected in 65 per cent, parenchymal lung lesions in 24.5 per cent and involvement of the parietal pleura in 30 per cent. Of 158 cases of lymphatic leukemia for which roentgenograms were had intrathoracic involvement was found in 72 per cent. Fifty-two per cent of these lesions are diagnosed as enlargement of the nodes of the hilus and/or mediastinum, the lung parenchyma was involved in 24.6 per cent, the pleura in 12 per cent and pleural effusion was demonstrated in 12 per cent. The mediastinum or hilus was involved in 83 per cent of 31 cases of lymphatic leukemia that came to necropsy, as was the parenchyma of 19 per cent and the parietal pleura of 6 per cent. Of 52 cases of myelogenous leukemia 82 per cent showed no mediastinal lesions roentgenographically. Discrete nodes at the lung roots were seen in but 9.6 per cent and parenchymal infiltration in only 7.6 per cent. In 23 cases of myelogenous leukemia, necropsy revealed myeloidization of the enlarged nodes of the mediastinum or hilus in 47 per cent, 13 per cent showed lesions in the lung parenchyma and in 52 per cent no lesions of the chest were found. In 10 cases of mycosis fungoides, nodes of the mediastinum or hilus were demonstrable in 10 per cent and

parenchymal infiltration in 30 per cent. One carcinoma of the pancreas and three carcinomas of the colon were found among the one hundred and sixty necropsies. The intrathoracic lesions may be silent clinically with negligible physical signs and symptoms. Only by frequent roentgen examination of the chest can the lesions be detected.

Incidence of Gastric and Duodenal Ulcer.—McMullen attempts to establish the relative incidence of gastric and duodenal ulcer on the basis of 4,400 consecutive gastrointestinal roentgen examinations. Only cases in which roentgen study confirmed the clinical diagnosis were considered. There were a total of 883 peptic ulcerations and of these 689, or 78 per cent, were duodenal and 194, or 22 per cent, were gastric. The literature shows a wide variation from these percentages. Of the 883 ulcers 594 were in men and 289 in women. No decade seemed to be exempt from peptic ulcer. The peak for duodenal ulcer in women was in the fourth decade and for gastric ulcer in the fifth decade. The corresponding peaks for men were the fifth and sixth decades. While roentgen and clinical study is necessarily less accurate than that based on actual observations at necropsy, it does show that a diagnosis of peptic ulcer was made in 20 per cent of the author's material.

Rocky Mountain Medical Journal, Denver

38:681-752 (Sept.) 1941

- Chronic Arthritis, with Special Reference to Etiology and Management. P. T. Bohan, Kansas City, Mo.—p. 698.
Treatment of Gunshot Wounds of Head. R. M. Stuck, Denver.—p. 705.
Postoperative Cholangiography. N. F. Hicken, Q. B. Coray and J. F. Orem, Salt Lake City.—p. 709.

South Carolina Medical Assn. Journal, Florence

37:163-192 (July) 1941

- Rupture of Varicose Ulcer of Esophagus: Case Report. W. L. McIlwain, J. R. Young, C. H. Young and J. M. Feder, Anderson.—p. 163.
Georgia Medical Association's Proposed Plan for Giving Care to Rural Communities. G. H. Collings Jr., Clemson.—p. 165.
An Unusual Case. V. W. Carpenter and W. M. Carpenter, Greenville.—p. 167.
Dental Root Cyst with Complete Involvement of Antrum. R. F. Zeigler Jr., Seneca.—p. 168.

37:193-232 (Aug.) 1941

- *Surgical Treatment of Bronchiectasis. F. P. Coleman and J. G. Seastrunk, Columbia.—p. 193.
Sulfathiazole in Treatment of Childhood Pneumonia. R. M. Pollitzer, J. F. Simmons and I. Yasser, Greenville.—p. 201.
Complications Connected with Treatment of Varicose Veins in Leg. W. H. Prioleau, Charleston.—p. 204.

Surgical Treatment of Bronchiectasis.—Coleman and Seastrunk state that bronchiectasis is present in almost every community. In the adult it is usually of many years' duration and it follows pneumonia associated with the exanthematous diseases, whooping cough, aspirated foreign bodies and other mechanical or inflammatory lesions which interfere with normal respiration. The treatment of bronchiectasis is essentially mass ligation of a lobe or the entire lung in one or multiple stages. The extent of bronchiectasis must be determined roentgenologically before a lobectomy is decided on. The postoperative course of patients subjected to lobectomy performed by the individual ligation technic is remarkably smooth. The temperature seldom rises above 101 F. The patients are usually out of bed in ten days and can be discharged in from thirteen to twenty-seven days postoperatively. Detailed reports of cases are necessary to evaluate the immediate results of the individual ligation technic. The authors performed lobectomy for bronchiectasis by the tourniquet technic in 2 patients and by the individual ligation technic in 10. In the 2 in whom the tourniquet was applied bronchopleural fistulas with an associated empyema developed, and postoperative hospitalization was, respectively, seventy-six and forty-two days. For the patients on whom a lobectomy was performed by the extramediastinal individual ligation technic the average hospitalization was seventeen days. There were no bronchial fistulas or empyemas. Hemorrhage did not occur preoperatively or postoperatively. All the patients subjected to operation are still living. Clinical cures resulted in all except the 2 patients in whom disease of the bilateral lower lobe was present prior to removal of the

most seriously involved lobe on one side. These 2 patients show improvement. In addition to these 12 patients, 2 were subjected to total pneumonectomies for bronchiectasis. The 2 patients survived the operation and 1 is well ten months postoperatively. The other patient died one month after discharge from the hospital from an influenzal pneumonia of the remaining lung.

Southwestern Medicine, El Paso, Texas

25:229-274 (Aug.) 1941

- Fractures in the Aged. L. W. Breck, El Paso, Texas.—p. 229.
Supportive Measures in Care of Surgical Patients (Transfusion of Blood and Plasma, Parenteral Administration of Solutions and Stimulants). T. H. Seldon and J. S. Lundy, Rochester, Minn.—p. 236.
Sarcoma of Pancreas. H. Shoemaker, Los Angeles.—p. 241.
Modern Management of Pneumonia. R. M. Smith, Dallas, Texas.—p. 250.
Fluorescent Tests for Syphilis (Plant Sap Reactions). E. L. Breazeale, T. R. Reusser and J. F. Breazeale, Tucson, Ariz.—p. 253.

Surgery, Gynecology and Obstetrics, Chicago

73:273-432 (Sept.) 1941

- Intra-Abdominal Photography in Color. T. N. Horan and C. G. Eddy, Detroit.—p. 273.
Compression of Heart Produced Experimentally. A. Yodice, Buenos Aires, Argentina, South America.—p. 277.
*Infusions of Blood and Other Fluids in General Circulation via Bone Marrow: Technic and Results. L. M. Tocantins and J. F. O'Neill, Philadelphia.—p. 281.
*Acute Appendicitis in Children. E. S. Taylor and R. G. Hodges, New York.—p. 288.
Beneficial Action of Oxygen Therapy in Experimental Shock. J. G. Schmedorf and T. G. Orr, Kansas City, Kan.—p. 301.
Papillary Adenocarcinoma of Kidney: Hypernephroid Tumors. W. C. Stirling and J. E. Ash, Washington, D. C.—p. 305.
Acute Gallbladder. R. R. Best, Omaha.—p. 312.
How to Use Catgut. E. L. Howes, Washington, D. C.—p. 319.
*Prophylactic Implantation of Sulfanilamide in Clean Operative Wounds for Reduction of Postoperative Infections. J. A. Key and T. H. Burford, St. Louis.—p. 324.
Effect of Hard Roentgen Rays on Intestines of Normal Dogs Fed on Inorganic Iron Compounds. Y. K. K'O, C. L. Tu and B. C. Chan, Peiping, China.—p. 333.
Combining Splenectomy with Total Gastrectomy. F. H. Lahey and S. F. Marshall, Boston.—p. 341.
Mucocoele of Appendix and Pseudomyxoma Peritonei: Clinical Review and Experimental Study with Case Report. M. Grodinsky and A. S. Rubinitz, Omaha.—p. 345.
Lateral Approach to Diverticulum of Esophagus. J. H. Hershey, St. Louis.—p. 355.
Study of Motility of Intact Uterus at Term. J. K. W. Ferguson, Toronto, Canada.—p. 359.
Study of Bacteriology of Cervix During Pregnancy and Its Relation to Puerperal Morbidity. E. A. Conti, D. L. O'Loughlin, J. W. McMeans and G. S. Lipman, Pittsburgh.—p. 367.
Dacryocystorhinostomy. W. L. Hughes, Hempstead, N. Y.; L. P. Guy and D. W. Bogart, New York.—p. 375.
Atraumatic Amputation Through Lower Thigh (Callander): Modified Technic. F. L. Pearl, San Francisco.—p. 381.
Cyclic Changes in Mammary Gland of Rhesus Monkey: Preliminary Report. H. Speert, Baltimore.—p. 388.
Postpartum Pyeloureteral Changes Following Hormone Administration. S. Lubin, L. S. Drexler and W. A. Bilotta, Brooklyn.—p. 391.

Infusion of Blood and Fluids via Bone Marrow.—The immediate absorption by the general circulation of fluid injected into the marrow cavity of the sternum suggested to Tocantins and O'Neill the use of this route for the rapid introduction of blood and other fluids into the blood stream. The puncture site in adults is either the manubrium or the body of the sternum midway between the angle of Louis and the xiphoid process. In infants or young children the upper portion of the tibia or the lower portion of the femur, at the metaphysis, is preferable. In children more than 3 years of age and in some adults it is preferable that the puncture be made in the manubrium, as its marrow cavity is relatively larger than that of other bones in young children, and in most adults the rate of flow is more rapid in the manubrium than in the body of the sternum. Great caution and but little force are necessary to penetrate the anterior plate of the manubrium in children. Double type needles only from 1.5 to 2.5 cm. should be used, so that the posterior plate will not be penetrated. Several aspirations may have to be tried during the same puncture. Precautions to follow are that no material should be injected unless a blood marrow mixture has been aspirated, care should be taken not to penetrate the posterior plate of the sternum and no solution should be injected until the air from the lumen of the needle

is removed. The authors have given fifty-two infusions to 33 adults and to 7 infants less than 2 years of age. The needle has been left in place for seven minutes to thirty and a half hours. The rate of infusion is governed by the density of the marrow. Rapid rates of injection by means of a syringe are justified only when shock is present. The amounts infused have varied between 50 and 2,000 cc. The manubrium of the sternum was used twenty times, the body of the sternum twenty times and the clavicle twice. The average rate of flow in the manubrium was 3.4 cc. and in the body 3.1 cc. per minute. The same bone has been used as many as three times within four days. Citrated blood, citrated plasma, 5 per cent dextrose solution and physiologic solution of sodium chloride have been infused. Patients who received infusions of blood had substantial rises of hemoglobin and erythrocytes within twenty-four hours. Intramedullary infusion should find its greatest use when rapid absorption of unchanged substances is desired and veins are not available, in widespread burns, mutilations, generalized edema, circulatory collapse, when a poorly developed venous system exists or veins are useless because of repeated punctures or injections of hypertonic solution and when it is not possible to maintain the needle in the vein. In automobile or airplane ambulances and in battle field emergency stations the relative immobility of a needle inserted in a bone might prove a distinct advantage. The method appears to be contraindicated in generalized infections accompanied by bacteremia. No hypertonic or other irritating solutions should be infused through this route. There seems to be little ground for fearing "fat embolism." The marrow selected for infusion must be highly vascular and have the lowest fat content. In such marrow the fluid injected infuses into the blood stream through the nearest veins, disturbing only a small fraction of its fat content.

Appendicitis in Children.—Taylor and Hodges reviewed the records of the 326 children with acute appendicitis who were admitted to the Babies' Hospital between January 1935 and June 1940. Only those patients in whom the primary disease was in the appendix were included. Only 28 of the patients were Negroes. The appendixes of 35.4 per cent of the patients were perforated, and the only 2 deaths of the series occurred among this group. The incidence of perforation was 71.7 per cent between the ages of 1 and 5 years. Difficulties in the communication of symptoms by these patients and in the evaluation of the early physical signs probably partly account for these high figures, but the authors stress that the parents' failure to realize that acute appendicitis may occur in the very young is of greater importance. The factors that influence the mortality and morbidity rate in acute appendicitis in children are, in order of their importance, duration of symptoms before operation, the type of immediate preoperative, operative and postoperative treatment and the age of the patient. The data indicate that there is nothing inherent in acute appendicitis in children that should make the mortality and morbidity rates higher than in adults. The absence of serious concomitant disease in children, particularly of the chronic type, their great recuperative powers and their organic resilience offset the difficulty of obtaining an accurate history and the physiologic anatomic drawbacks. The authors think that their low mortality was the result of immediate operation, routine use of the McBurney incision, simple incision and drainage if removal of the appendix would entail extension of the disease, parenteral administration of fluids after operation to satisfy the unusual demands, free use of whole blood and plasma intravenously to combat protein losses, the use of the indwelling Levin tube with constant Wagensteen suction, the anticipation of ileus and a nonoperative, conservative attitude toward secondary abscesses in the lower part of the abdomen. Chemotherapy is of great value in the treatment of complications unrelated to the disease, e. g. pneumonia. The authors saw little evidence of its benefit in peritonitis of appendical origin.

Sulfanilamide in Operative Wounds.—Key and Burford list a series of one hundred and fifty consecutive clean operations in which sulfanilamide powder was implanted in the wound. It has been shown that a saturated solution of sulfanilamide crystals inhibits the growth not only of susceptible strains of streptococci but of staphylococci and gas bacilli and other

organisms not susceptible to the drug in dilute solutions. The efficiency of the drug varies inversely with the number of organisms present. Consequently a clean operative wound, contaminated by relatively few pathogenic organisms, is ideal for the inhibition of the growth of these organisms by the drug to a point at which the patient's defense mechanism can destroy them. Sulfanilamide powder remains in wounds for about forty-eight hours, saturates the fluid in the wound and diffuses into the surrounding tissue. For clean operative wounds much less of the drug is used than for contaminated ones. Rarely more than 5 Gm. is placed in a single wound. It is the impression of the authors that the wounds of their patients healed firmly in approximately the time required for similar wounds without sulfanilamide implantation. Stitch abscesses have been absent. All the wounds healed by primary intention, indicating that sulfanilamide does not interfere with healing. With the exception of the collection of lymph (which later became infected) in one of the wounds, the only postoperative complication was transient fever above 101 F. in 7 patients. There were no local signs of infection. One of the wounds was opened for a short distance but no infection was found. The sulfanilamide may have been partly responsible for the fever, but other than causing uneasiness it did no harm. Similar postoperative fevers have been encountered in patients without infection who had no sulfanilamide implanted in their wounds.

Texas State Journal of Medicine, Fort Worth

37:267-330 (Aug.) 1941

- Facts and Fancy About Vitamin A and B Complex Deficiency. F. W. Schlutz, Chicago.—p. 275.
Art of Treating Children. T. A. Tumbleson, Beaumont.—p. 281.
Treatment of Acute Ileocolitis. D. Greer, Houston.—p. 284.
Some Pediatric Therapeutic Suggestions. H. L. Moore, Dallas.—p. 286.
Reappraisal of Prelacteal Feeding. S. Kaliski, San Antonio.—p. 288.
Chronic Nasal Obstruction in Childhood. R. Moore, Dallas.—p. 290.
Duration of Immunity to Diphtheria Following Immunizations. E. G. Schwarz, Fort Worth.—p. 292.
Use of Sedatives in Children. J. E. Ashby, Dallas.—p. 295.
Milk and Appetite. M. R. Woodward, Sherman.—p. 297.
Prevention and Treatment of Skin Diseases in Early Infancy. L. D. Hill Jr., San Antonio.—p. 298.
Administration of Fluids in Pediatric Practice: Why, When, How. J. G. Young, Dallas.—p. 300.
Clinical Evaluation of Use of Immune Human Placental Globulin in Attenuation of Measles. A. Bloxson, Houston.—p. 302.
Public Health Approach to Control of Diarrhea and Enteritis in Infants. L. T. Cox and L. P. Walter, El Paso.—p. 304.
Relapsing Fever. J. O. Chambers, Fort Worth.—p. 308.
Early Local Treatment of Snake Bite. R. S. Fillmore, Jacksboro.—p. 311.
Necrosis of Skin Due to Sulfathiazole. W. R. Klingensmith, Amarillo.—p. 313.
Osteomyelitis of Skull. F. B. Malone, Lubbock.—p. 314.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

49:419-466 (Aug.) 1941

- Maintenance of Normal Basal Metabolic Rate After Thyroidectomy. J. L. DeCourcy, Cincinnati.—p. 419.
One Reason for Failure in Surgical Control of Toxic Hyperplastic (Exophthalmic) Goiter. G. B. Kent, Denver.—p. 423.
Surgical Treatment of Thyrotoxicosis as Related to Geriatrics. T. O. Young, Duluth, Minn.—p. 431.
*Lipocaine in Treatment of Diarrhea of Hyperthyroidism: Preliminary Report. E. C. Bartels, Boston.—p. 439.
Effects of Iodine and of Thyroactivator on Cervical Sympathetic Ganglions and Those of Nodosa of Vagi in Guinea Pigs: Preliminary Report. S. Brock, Chicago.—p. 447.
*Peritonitis: Treatment with Peptone Broth. C. G. Bain, Centralia, Wash., and H. Feagles, Chehalis, Wash.—p. 449.
Clinical Significance of Accessory Bones of Foot. A. Gottlieb, Los Angeles.—p. 452.
Liver Function. E. A. Nixon, Seattle.—p. 454.
Quantitative Test to Evaluate Methods of Hand Sterilization. H. Sears, W. E. Smick, G. C. Schauffler, and R. C. Shoemaker, Portland, Ore.—p. 458.

Lipocaine for Diarrhea of Hyperthyroidism.—Because of similar fatty changes in the livers of depancreatized dogs and in hyperthyroid patients, Bartels gave lipocaine (an internal secretion of the pancreas) to 15 patients with hyperthyroidism to determine what change it would have on the hippuric acid function test. No demonstrable beneficial effect could be ascertained. Six patients with hyperthyroidism suffering from a troublesome diarrhea that failed to respond to the usual measures were given the substance. Three of these patients were extremely

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Edinburgh Medical Journal

48:505-576 (Aug.) 1941

- Simplification of Blood Examination. W. F. Harvey.—p. 505.
Basis of Temperament. A. N. Bruce.—p. 520.
Value of Tracheobronchoscopy and Esophagoscopy in Diagnosis and Treatment. G. E. Martin.—p. 535.
Studies on Stored Blood: VIII. Effect of Transfusion on Capillary Resistance: Preliminary Note. H. Scarborough.—p. 555.

Journal of Pathology and Bacteriology, Edinburgh

53:1-160 (July) 1941

- Physiology of Capsulated Streptococci. J. E. Morison.—p. 1.
Capsulation of Streptococci and Its Relation to Diffusion Factor (Hyaluronidase). D. McClean.—p. 13.
Cervical Abscesses of Guinea Pigs. W. Smith.—p. 29.
Streptococcus Toxin-Antitoxin Flocculation and Its Relation to Rabbit Skin Test. H. Proom.—p. 39.
Bacteriologic Examination of Water Samples, with Reference to Direct and Secondary Incubation at 44 C. L. F. L. Clegg.—p. 51.
Diphtheria Prophylaxis: Modern Methods of Preparing and Assaying Prophylactic Agents, with Note on Essential Nature of Toxoid-Antitoxin Floccules. A. F. Watson, R. A. Taggart and G. E. Shaw.—p. 63.
Solitary Plasmocytoma of Bone. R. A. Willis.—p. 77.
Toxins Produced by Clostridium Welchii in Simple Medium. A. W. Taylor and J. Stewart.—p. 87.
In Vitro Production of Toxin from Strains of Clostridium Welchii Recently Isolated from War Wounds and Air Raid Casualties. Muriel Robertson and J. Keppie.—p. 95.
Intimal Coronary Artery Hemorrhage as Factor in Causation of Coronary Occlusion. M. G. Nelson.—p. 105.
Essential Identity of Klippel-Feil Syndrome and Iniencephaly. J. R. Gilmour.—p. 117.
Distribution of Fatty Change in Kidneys and Some Factors Influencing Its Production. J. H. Dible and G. Popják.—p. 133.

Medical Journal of Australia, Sydney

2:103-130 (Aug. 2) 1941

- *Concentration of Hemoglobin in Blood of Normal Men. H. S. H. Wardlaw.—p. 103.
Problems in Medical Examination of Recruits. A. B. Anderson.—p. 108.
Medical Examination of Army Recruits. G. R. Troup.—p. 110.
Problems of an Army Medical Examiner. R. J. D. Turnbull.—p. 111.

Concentration of Hemoglobin in Normal Men.—Wardlaw determined the mean hemoglobin content of the blood of 1,512 normal males from 14 to 50 years of age. The material was heterogeneous with regard to race and locality. Most of the subjects were medical students or staff members. There were about 200 normal males of unspecified occupation and 20 soldiers. The results are a mean of that obtained on these 1,512 men by seventeen investigators in eight countries and of determinations made on 77 students and members of the medical school staff in Sydney and 25 adult male aborigines in central Australia. The most frequent values or modes are 15.6 Gm. per hundred cubic centimeters for the collected series and 16.1 Gm. for the Sydney results. The mean values are 15.1 and 16.1 Gm., respectively. The main conclusion to be drawn from the survey is that the means of different groups show a surprisingly restricted variation in spite of the diversity of origin of subjects and of methods employed (15.57 ± 1 Gm. per hundred cubic centimeters of blood). The results give no indication that standards of hemoglobin in blood need be different for different localities (apart from the effect of altitude). A standard figure within the range of the total mean values should be satisfactory. The standard of 15.6 Gm. per hundred cubic centimeters of blood suggested by Haden in 1922 appears more suitable than that of Haldane (13.8 Gm. per hundred cubic centimeters). The necessity for checking colorimetric standards and expressing results as grams of hemoglobin rather than as percentages of a standard figure are emphasized. The mean concentration of hemoglobin in the blood of normal women was found by eleven investigators in eight countries to be $87 (\pm 5)$ per cent of that of normal men.

Annali d'igiene, Rome

51:237-308 (April) 1941. Partial Index

- *Rapid Method (Manzullo) for Bacteriologic Diagnosis of Diphtheria. F. Mulè.—p. 243.

Rapid Method for Diagnosis of Diphtheria.—The Manzullo sodium tellurite test for culturing diphtheria bacilli in three hours was described in THE JOURNAL, Sept. 3, 1938, page 954. Results with the test were reported by Agneti in the *Giornale di clinica medica*, Parma, Dec. 30, 1939, and were abstracted in THE JOURNAL, March 9, 1940, page 931. Mulè compared the results of Manzullo and Loeffler's cultural methods in 130 cases of pharyngeal and rhinopharyngeal diphtheria. He found that Manzullo's method is rapid and more sensitive than the Loeffler method. Manzullo's method of moistening the pseudomembranes with a 2 per cent sodium tellurite solution and making a diagnosis in ten minutes from the darkening of the exudate is not reliable.

Bollettino, Milan

12:57-100 (March-April) 1940. Partial Index

- *Chromatic Reaction for Tuberculosis. R. Lucchesi.—p. 70.

Chromatic Reaction for Tuberculosis.—The Lucchesi flocculation reaction is performed as follows: A 0.2 per cent hexamethylpararosaniline solution in 95 degree alcohol is prepared. With a graduate pipet 0.05 cc. of tuberculous antigen is placed in a tube to which 0.045 cc. of a 3.5 per cent sodium chloride solution is slowly added. The mixture is poured into a tube containing 0.05 cc. of a 5 per cent benzoic solution and is passed from tube to tube two or three times, after which 0.2 cc. of the hexamethyl staining solution is added. The tube is shaken fifteen to twenty times. The finger tip is punctured with Frank's lancet and blood is withdrawn into a 0.03 cc. graduate pipet. A drop is placed on the concavity of a glass slide, is covered with a drop of a 3 per cent sodium chloride solution, is stirred with a glass rod and is evenly distributed. A drop of the antigen solution is then added and the glass gently rotated in all directions for four or five minutes, after which it is observed under the microscope with a 50 or 60 magnification. The reading of the test is to be made within fifteen minutes under intense natural reflected light. Moderate flocculation giving bluish violet flocculates of small size observable between the blood cells on a uniformly red field indicates a weakly positive result (+), large bluish violet flocculates indicate a strongly positive result (++), and very large bluish violet flocculates indicate a very strongly positive result (+++). The flocculates are easily differentiated from non-specific particles and are not present when the result is negative (—). The test is rapid, easily performed, inexpensive, sensitive and specific for tuberculosis, the author reports. The results paralleled those of the Meinicke tuberculous reaction in all serums tested by the author with the two methods.

Cuore e circolazione, Rome

25:129-168 (April) 1941. Partial Index

- *Hypotensive Action of Magnesium Sulfate by Intravenous Route. R. Spinelli.—p. 129.

Hypotensive Action of Magnesium Sulfate.—Spinelli administered intravenously 10 cc. of isotonic and hypertonic magnesium sulfate solutions in a concentration of 7.35 and 25 per thousand, respectively, to 3 persons with normal blood pressure and 8 patients with hypertension. It caused slight transient hypertension followed by considerable hypotension, which was more pronounced when the drug was administered in hypertonic solution. The pressure was lowered about 30 mm. of mercury in patients with hypertension and chronic or subacute nephritis, about 10 mm. in patients with hypertension and arteriosclerosis, and between 10 and 15 mm. in normal persons and in patients with hypertension and aortic insufficiency. The blood nitrogen rose in all of the cases. The author performed experiments in dogs given an intravenous injection of 15 Gm. of urea in 30 cc. of water, alone or with 10 cc. of a 25 per thousand magnesium sulfate solution. The blood pressure was lowered and the elimination of urea retarded. The author concludes that magnesium sulfate produces hypotension which is

proportional to the state of the arteries and retention of blood urea. Best results from the treatment are obtained in nephritis and hypertension when the patients are relatively young and the disease is not of long duration. The dissociated effect of the drug in lowering blood pressure and increasing urea in the blood indicates that retention of urea in the blood is not the cause of hypertension in nephritis.

Wiener medizinische Wochenschrift, Vienna

91:341-366 (April 26) 1941

Rare Antethoracic Esophagoplasty. K. Carsky.—p. 341

Septic Endocarditis. E. Tilo.—p. 344

*Complications in Monaldi's Suction Drainage. S. Korec.—p. 352

Detachment and Splintering of Anterior Layer of Stroma of Iris in Glass Blowers. Cataract and Its Diagnostic Value. A. Gala.—p. 355

Complications in Monaldi's Suction Drainage.—According to Korec, the rare complications during the introduction of the drain are embolism, and hemorrhage caused by the trocar, while insignificant incidents during suction are secondary infection of the tract and hemorrhage due to incorrect position of the drain. Among the more serious complications are pleural detachment with subsequent empyema and a pleuropulmonary and pleuroparietal fistula, progression of the pulmonary processes, severe hemorrhage during suction, and extrapulmonary hematogenous metastases. The author regards the detachment of the parietal from the visceral pleura as the most dangerous complication. He observed 2 patients with this complication, 1 of whom contracted later an extrapulmonary hematogenous metastasis in the form of a gonitis, and subsequently a severe hemorrhage. Progression of the pulmonary process as the result of mechanical irritation by the drain and suction was observed in 1 case during the sixth week of suction. The patient lost his appetite, became weaker and had an increase in temperature. Suction was interrupted. Roentgenoscopy disclosed a widely inflamed area about the cavity, which a few days later progressed to involve the contralateral side. The patient died. The author's aim in calling attention to these complications was not to advise against the suction treatment, but to stress the need of caution. He still thinks that in properly selected cases Monaldi's method is justified and produces noteworthy results.

Zeitschrift für klinische Medizin, Berlin

139:127-258 (April 1) 1941 Partial Index

Change of Protein Bodies in Serum of Cancer Patients. Experiences with the Bendien-Love Method. R. Merten.—p. 127

Detection and Evaluation of Polarographically Demonstrable Changes in Human Serum and Its Filtrates. R. Merten.—p. 133

Potassium as Tissue Diuretic. Investigations on Diuresis in Cardiac Dropsy. H. W. Bansi and R. Repkowitz.—p. 164

Influence of Phenobarbital on Oxygen Deficit After Exertion in Heart Disease. H. Goldschmitt.—p. 182

*Investigations on Etiology of Scarlet Fever. R. Abderhalden.—p. 190

Diagnosis of Primary Malignant Tumors of Pericardium and of Tumors of Cardiac Wall Infiltrating the Pericardium. P. Jucker.—p. 208

Sedimentation Speed of Erythrocytes and Environmental Temperature Acceleration in Presence of Low Temperature and How to Avoid It. M. Sato and T. Otuka.—p. 226

*Unusual Thromboses During Pregnancy and Their Pathologic Significance. H. Oettel.—p. 248

Etiology of Scarlet Fever.—According to Abderhalden, scarlet fever patients eliminate ferments in their urine which are able to decompose the protein of hemolytic streptococci that have been obtained in cultures from the pharyngeal smears of scarlet fever patients. The protein of hemolytic streptococci not originating from scarlet fever patients, however, is influenced either slightly or not at all. Patients with nonscarlatinal anginas excrete only such ferments as are able to decompose protein from hemolytic streptococci not originating in scarlet fever patients. The urine of entirely healthy patients contains no ferments capable of hydrolyzing bacterial proteins (hemolytic streptococci, meningococci, influenza organisms). These findings prove that the hemolytic streptococci are significant for scarlet fever and that the protein structure of scarlet fever streptococci differs from that of other hemolytic streptococci. Thus both types can be differentiated with the method which detects protective ferments and it is possible to differentiate scarlet fever angina from ordinary angina during the early stage. After from one to several weeks the excretion of the

specific ferments ceases. It may then happen that protein of nonscarlatinal streptococci is decomposed or that both types of streptococci are attacked. The latter observation can be made also at the onset of scarlet fever. Thus the conclusion seems to be justified that the scarlet fever streptococci originate from ordinary hemolytic streptococci. The process is reversible. The author discusses the practical significance of these observations.

Thrombosis During Pregnancy.—Oettel reports two unusual cases of venous thrombosis in connection with gestation. In one patient gestation was complicated by a nephropathy and premature detachment of the placenta. This woman had a thrombosis of the superior vena cava. She exhibited extreme dilatation of the cutaneous veins in the region of the trunk. The other woman had symptoms of eclampsia, anemia and hyperemesis. She acquired a temporary thrombosis of the inferior vena cava. Extensive edema developed in the lower half of the body, particularly in the labia. Thrombosis of the inferior vena cava was deduced from the fact that the edema did not respond to cardiac medication. The author discusses the importance of the liver for protein changes in the blood which are responsible for the tendency to thrombosis in the course of gestation. He is of the opinion that toxic protein bodies act chiefly on the vessels by producing impairment of the intima and a tendency to spasm. Whether a hepatic disorder and toxins of the liver are always involved has not been definitely ascertained, but the substances in question are most likely proteins.

Folia Pharmacologica Japonica, Kyoto

32:103-242 (June) 1941 Partial Index

*Observations on Experimental Scurvy. K. Kondo.—p. 192

Experimental Scurvy.—Kondo investigated the blood changes in guinea pigs fed on a scorbutogenic diet and determined the pharmacologic action of epinephrine in these animals. He found that concomitant with a sudden decrease in body weight, beginning about the end of the second week, severe anemia developed in these animals, as evidenced by the reduction in both cell count and hemoglobin as well as by the appearance of abnormal red cells in the circulating blood. A generalized leukocytosis prevails with relative lymphocytosis, but the blood platelets tend to diminish. The coagulation time of the blood remained stationary. Addition of ascorbic acid to the experimental diet prevented the occurrence of these blood changes, and the animals then maintained their normal body weight. Satisfactory improvement in both clinical symptoms and blood picture could be attained also with the addition of green vegetables to the diet as late as after eighteen days of experimental scorbutogenic feeding. The blood serum of animals with active scurvy is, within one hour after injection into the peritoneal cavity of normal guinea pig, capable of producing leukocytosis, thrombopenia and a reduction in red cell count. This strongly indicates the existence of a toxic substance in the scorbutic serum. No significant alterations in epinephrine sensitivity was noted on the excised portion of intestine of a scorbutic animal as compared with that of a normal guinea pig.

Nordisk Medicin, Stockholm

10:1977-2070 (June 28) 1941

Hospitalstidende

Formation of Calculi in Urinary Tract. Experimental and Theoretical Contribution. Fr. Brauner, H. Krieger-Lassen and H. Palm Praest.—p. 1977

*Development of Cirrhosis of Liver after Acute Hepatitis. Illuminated by Aspiration Biopsy. N. B. Krarup and K. Roholm.—p. 1991

Hypoproteinemia in Leukemia Myeloides. O. Thordarson.—p. 2092

Cirrhosis of Liver After Acute Hepatitis.—Krarup and Roholm's examinations of 12 cases of grave protracted or recurring hepatitis disclosed a gradual transition from the usual acute hepatitis to fully developed Laennec's cirrhosis. They assert that decided chronic changes may develop in the course of weeks, but that the cirrhosis formation may also extend insidiously over several years. They advise that chronic hepatitis should be borne in mind when the course of hepatitis is prolonged or when the condition shows a tendency to recurrence. None of the patients in question were addicted to the use of alcohol.

Book Notices

Sulfanilamide and Related Compounds in General Practice. By Wesley W. Spink, M.D., Associate Professor of Medicine, University of Minnesota Medical School, Minneapolis. Cloth. Price, \$3. Pp. 256, with illustrations. Chicago: Year Book Publishers, Inc., 1941.

The importance of the sulfonamide drugs in modern therapeutics is reflected in the voluminous literature that has accumulated since the first report on sulfanilamide which appeared in 1936. The author of this volume states that he consulted over one thousand original articles, reviews and monographs in the preparation of the book. The first important textbook on the sulfanilamide drugs to appear was "Sulfanilamide Therapy of Bacterial Infections" by Mellon, Gross and Cooper. Shortly thereafter the authoritative textbook "Clinical Use of Sulfanilamide and Sulfapyridine and Allied Compounds" by Long and Bliss became available. Dr. Spink's volume comes in natural sequence to those previously published.

After disposing of historical considerations and general principles of therapy the author devotes a chapter each to neoprontosil, sulfanilamide, sulfapyridine and sulfathiazole. Ten chapters are given to specific problems in treatment. For example, chapters are devoted to treatment of pneumonia and its complications, treatment of staphylococcal infections, local use of the sulfonamide compounds and use of the sulfonamide compounds in dentistry.

The final two chapters are devoted to the consideration of sulfaguanidine and sulfadiazine. Developments have been so rapid in the field that a book attempting to cover the subject is in danger of being out of date by the time it makes its appearance. Fortunately for this volume the author was able to write the last two chapters just up to the date of publication.

This book provides a thoroughly authoritative discussion of the subject. All through the book the author reveals his critical judgment; he knows when something has been convincingly demonstrated and when reported findings should be taken with a grain of salt. Such critical judgment is particularly essential in this special field. So much has been written and so many unsound deductions have been recorded in the literature that a zealot can find material to prove or disprove almost anything. It is gratifying likewise to find that the author has been careful to weigh the expected benefits of sulfonamide therapy against the possible deleterious effects. For instance, a conservative attitude is revealed in the use of sulfanilamide in the treatment of scarlet fever and tonsillitis.

While the author submits recommendations for the use of the sodium salt of sulfapyridine orally, subcutaneously and intrathecally, he might have done a service by indicating his disagreement with such pointless and possibly injurious use of the drug. The same criticism applies to instances in which the author is merely content to quote an unsound opinion reported by some one else without definitely showing the reader that he disagrees with it.

Despite a few loose ends of this kind, the volume is an important contribution and may be recommended to any one who contemplates using the sulfonamide drugs discussed. The value of the book is enhanced by illustrative case reports and clinical charts that accompany the discussion of specific clinical problems. It is hoped that in subsequent editions the use of sulfadiazine and perhaps sulfaguanidine will be absorbed into the marrow of the volume; but one may also express the hope that the author will have the courage to disregard, as he commendably already has, the numerous unessential proprietary modifications of sulfanilamide and its derivatives that are now beginning to flood the market.

El diagnóstico precoz del cáncer. Por Ricardo Posada, Hijo, jefe de los servicios de cancerología y radium (S. B. P.) en el Hospital Rosales, San Salvador. Cloth. Pp. 147, with illustrations. San Salvador: Imprenta Nacional, 1941.

In many a Latin American country, where so much remains to be done in the way of medical education of both the professional and the layman, this book will be exceedingly useful. For in gathering together his personal experience on malignant disease the author has done it in such a way that the book turns out to be an excellent summarized treatise on cancer. The nonspecialized doctor and the medical student will find in

its pages what is basic, clinically, in the diagnosis, and the layman of a certain cultural level will find in its diagrams and photographs how to get an orientation with regard to the disease. The author gives the statistics of his cases observed in the Ministry of Public Welfare dispensary for early diagnosis of cancer. Among 221 patients there were 185 females and 36 males. The most common location was the uterus (44 per cent), next the skin (12 per cent) and in third place the breast (6 per cent). Details are given of treatment used and their results, cancer of the uterus being especially emphasized. However, the main purpose of the book is to stress the importance of the early symptoms, and this is done clearly and thoroughly for each type of cancer. On the other hand there is nothing in the book suggesting the presence in San Salvador Republic of types of disease different from those observed in other countries where the disease is exhaustively studied.

Vitamin K. By Hugh R. Butt, M.D., M.S. in Medicine, F.A.C.P., Consultant, Division of Medicine, Mayo Clinic, Rochester, and Albert M. Snell, B.S., M.D. in Medicine, Head of Section in Division of Medicine, Mayo Clinic. Cloth. Price, \$3.50. Pp. 172, with 39 illustrations. Philadelphia & London: W. B. Saunders Company, 1941.

The authors represent one of three groups of investigators which independently of one another showed that the bleeding tendency of patients with obstructive jaundice could be prevented by treatment with vitamin K. They have also played an important part in the demonstration of vitamin K deficiency in connection with certain intestinal disorders. The book gives a survey of their own work in this field, in which they have had considerable clinical experience, and a brief reference to the work of other investigators. It further contains an attempt to give a general orientation about the other problems concerning vitamin K, biologic, chemical and clinical. The parts of the book which deal with the history of the work done at the Mayo Clinic are by far the most detailed. Most interesting to read are perhaps the historical notes of the bleeding tendency of jaundiced patients, dating back to Georg Wolfgang Wedels in 1683. Three hundred and fifty references are collected and, as far as papers in the English language are concerned, the list of publications dealing with the treatment of cholemic bleeding tendency with vitamin K is nearly complete to the date of issue. The other parts of the book are weaker. The work of other authors is sometimes misunderstood on important points or not cited. Several publications appear to be quoted rather haphazardly. Clearcut criticism and stress of the essential points have not been sufficiently applied. The reading of the book leaves the impression that there is a discrepancy between its title and plan and its main object, which is not as much a general survey as an account of the work done by the authors and their associates in a particular though important field of research on vitamin K.

Das Vitamin K und seine klinische Bedeutung. Von Dr. Fritz Koller, Privatdozent für Innere Medizin an der Universität Zürich. Mit einem Geleitwort von Professor Dr. W. Löffler. Boards. Price, 6.75 marks. Pp. 131, with 15 illustrations. Leipzig: Georg Thieme, 1941.

The author, a Swiss, is associate professor of internal medicine at the University of Zurich. He has worked in the field of clinical vitamin K investigation since the role of vitamin K in cholemic bleeding tendency became known, and he was the first to describe vitamin K deficiency in adult patients with sprue. Koller's book gives an excellent description of all clinical aspects of vitamin K and also a good explanation of its biology and chemistry. The main object is the critical examination of all the problems which develop in the clinical and pathologic fields more than a detailed account of its recent history. To this purpose the author applies his own clinical material. Methods and means are described in an unusually clear way. One will scarcely find a more efficient account of the use and interpretation of Quick's prothrombin time method than that given by Koller. The vitamin K preparation used by Koller is not methyl naphthoquinone but a water soluble ester of methyl naphthohydroquinone, which is more suitable for clinical use.

The highlights of the book are the careful analysis of the hemorrhagic diathesis in obstructive jaundice and parenchymatous liver diseases and the use of vitamin K treatment for diagnostic purposes. In the description of the hypoprothrombinemia of the newborn the historical part is somewhat incomplete and the author's own material not so comprehensive, but

the way in which the subject is treated is clear and logical. The hypoprothrombinemia of the newborn is ascribed partly to lack of vitamin K in the newborn infant and partly to a transient insufficiency of the liver. The literature list comprises two hundred and sixty-one publications.

Clinical Immunology, Biotherapy and Chemotherapy in the Diagnosis, Prevention and Treatment of Disease. By John A. Kotner, M.S., M.D., Dr. P. H., Professor of Medicine, Temple University School of Medicine, Philadelphia, and Louis Tuft, M.D., Assistant Professor of Medicine and Chief of Clinic of Allergy and Applied Immunology, Temple University School of Medicine. Cloth. Price, \$10. Pp. 941, with 27 illustrations. Philadelphia & London: W. B. Saunders Company, 1941.

This work brings together within a single volume the principles of immunology, biotherapy and chemotherapy which bear an important relationship to the management of infections. The clinical correlation of these fields which its scope affords makes the book invaluable to students and teachers of medicine but particularly to practicing physicians. Viewed in this light, the book represents a timely successor to the previous contributions of the senior author "Infection, Immunity and Biologic Therapy" and "Principles and Practice of Chemotherapy." The junior author is perhaps best known for his book "Clinical Allergy."

The present work embraces a discussion of the mechanisms of infection, immunity, anaphylaxis and allergy and the part played by these in the diagnosis, prevention and treatment of diseases. In presenting the subject matter the authors have arranged the text in two parts, part I comprising the general aspects of infection, immunity, biotherapy and chemotherapy and part II the practical applications of these in the prophylaxis and treatment of disease. Each part is conveniently divided into chapters and each chapter has a summary, a feature of particular value to students. Whereas the chapters in the first part of the book are concerned with discussions of the various phenomena of infection, immunologic principles, anaphylaxis and allergy, diagnostic reactions, immunization and biologic and chemical therapy, those in the second part are devoted to consideration of the individual diseases. Such an arrangement increases the usefulness of the text in that both general data and specific data are readily available.

The format of the book is pleasing, and the paragraphs are printed in the conventional textbook style. The use of italics for words which carry a technical definition or interpretation makes for clarity and emphasis of important terms. The nomenclature of infectious agents which is employed is as simple as is commensurate with accuracy and is not confused by use of the less familiar synonyms. The authors and the publisher are to be congratulated for the careful editing and printing of the material that is presented.

As with all publications of this type, the work cannot be expected to be completely abreast of the rapid advancements in the various subjects discussed, which are constantly reported in the current medical journals, particularly the field of chemotherapy in the bacterial infections. The authors have wisely avoided details which are as yet in the experimental stage. Also, while certain opinions expressed may be questioned by some, these for the most part are conservative: the discussions are mainly concerned with a presentation of the facts, enabling the reader to draw his own conclusions. Altogether, this book represents a real contribution as a reference book and may well serve as an authoritative guide to future developments which will undoubtedly be forthcoming in the phases of medicine covered.

Introduction to Psychobiology and Psychiatry: A Textbook for Nurses. By Esther Loring Richards, M.D., Sc.D., Associate Professor of Psychiatry, Johns Hopkins University, Baltimore. Cloth. Price, \$2.50. Pp. 357. St. Louis: C. V. Mosby Company, 1941.

Although the author does not claim that this book is written as a textbook on psychiatric nursing, she intends that it should be read by nurses. It is divided into two parts. The first part presents reasons why the personality should be studied and discusses such study by means of the writing of an autobiography, and the author objectifies various aspects which are found in studying the personality. In several chapters on personality evaluation, psychology in a nonpsychiatric sense is touched on, but unfortunately the brand of psychology which is discussed is partially of the author's own making and one finds only

superficial resemblances to the accepted psychologies now in use by many clinicians and by most academic psychologists. Too many functions of the brain which are comprehended in a deeper sense today are treated by the author in the manner in which old time "faculty" psychologists used to treat them. The author, for instance, talks about instincts, of constitutional endowments, of emotional-energy equipment, conative processes and parental instincts. Study of these by experimental psychologists and biologists raises the question whether they ever exist in the clear sense in which Dr. Richards tends to imply. She talks about such traits as the capacity of "clear thinking" and the "capacity to systematize." While, undoubtedly, one can segregate certain mental reactions to fulfil the criteria which Dr. Richards brings out, the ideas must be criticized in their lack of conventionality, which would make them more valuable for a discussion by a scientific group than for memorization or learning by a group of nurses. The second part of the book deals with current psychiatric entities such as the psychoses, psychoneuroses and the whole gamut of disorders which are studied by the psychiatrist. Psychobiologic terms are injected in the discussion, which would tend to complicate the work adjustment of any nurse who would intend to work outside the atmosphere of the Phipps Psychiatric Clinic, where these terms had their beginnings and are in current use. The general psychiatric discussions are, however, basically sound, though brief. There are excellent and detailed descriptions of the symptomatology and progress of characteristic cases. The treatment programs are not given much space, nor are any discussions of the nurse's responsibility with regard to caring for each kind of patient. The book is lucidly written, is interesting and, except for the criticisms suggested, should prove to be a useful addition to the nurse's library.

Essentials of Endocrinology. By Arthur Grollman, Ph.D., M.D., Associate Professor of Pharmacology and Experimental Therapeutics in the Medical School of the Johns Hopkins University, Baltimore. Cloth. Price, \$6. Pp. 480, with 74 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1941.

Little is known but much is written about endocrinology. The purchasing physician has been disappointed so many times that he should be pardoned if he examines a new book in this field with a critical eye. Grollman is a full time laboratory worker who apparently has had little contact with patients. His laboratory work has been limited to specialized fields; in this book there are but a half dozen references to his published papers.

The preface indicates that he believes that "clinical endocrinology is frequently befuddled by accepting unproved assumptions as basic facts and building upon the insecure foundations thus established a maze of fanciful and ill founded conjectures." This book contains a cursory discussion of almost everything even remotely connected with the endocrine glands. The reader is relieved to learn that "other ductless glands (the tonsils, glomus coccygeum, etc.) are also excluded." None of the sciences are neglected. There is a discussion of the embryology, gross anatomy, comparative anatomy, histology, pathology, physiology and pharmacology of each gland plus a clinical discussion with recommended treatment for endocrine disturbances.

When he reads the clinical discussions in this book the medical reader is likely to find himself becoming annoyed. By what right does the author presume to help him with clinical diagnoses and suggest treatment for patients? How much experience has he had in the diagnosis and treatment of goiter to permit him to write the following advice: "The patient should receive ample sedation (phenobarbital) on the evening prior to the operation as well as the usual dose of morphine the following morning. The use of a basal anesthetic (avertin) is advisable. Thyroidectomy should be performed by a skilful operator with the attendance of a competent anesthetist. Local or the less devastating general anesthetics (ethylene or cyclopropane) should be employed. Postoperatively, glucose and saline infusions are indicated."

What experience permits the author to make the following observations? "The diagnosis of moderate or severe diabetes usually entails no difficulties. The presence of marked glycosuria, a highly elevated blood sugar and acidosis are pre-

sumptive evidence of the existence of the disease and require immediate treatment." It will prove helpful to learn that "In the differential diagnosis of diabetic coma, one must keep in mind the fact that coma may also be due to hypoglycemia, acute infections in children, meningitis, uremia, brain tumor, cerebral accidents, etc. A simple test with Nessler's reagent makes possible the demonstration of acetone in the expired air in case of diabetic coma."

It was hoped that more reference would be made to the contributions of the author's clinical colleagues in the treatment of Addison's disease, yet the crisis of this disease rates only nine lines.

From a therapeutic point of view this book is without value.

Doctors Don't Believe It—Why Should You? Facts and Fallacies About Health with Practical Guidance for the Layman. By August A. Thomen, M.D. With introduction by Logan Clendening, M.D., and the Right Honorable Lord Horder, Physician in Ordinary to the King of England. Cloth. Price, \$2.50. Pp. 384. New York: Simon & Schuster, 1941.

This volume is offered as a two in one health book, representing an exposé of facts and fallacies concerning health combined with facts and figures which provide the scientific bases and further instruction as to the prevention and treatment. The title of the volume is, of course, extraordinary, but the publishers report that it was selected by a group of advisers who were given their choice among several titles. In many ways the title is not at all applicable to some of the material contained. For instance, it is hard to read an item entitled "What Is Trichinosis?" and find in it anything which is covered by the title "Doctors Don't Believe It." Notwithstanding these minor considerations the book offers much important material expressed in a form that is easily readable. It is divided into a series of chapters covering food, diet and weight reduction; your daily life; major ailments; the venereal diseases; cancer; the common cold; allergy, asthma and hay fever; minor ailments and remedies; mind and senses, and birth, marriage and death. The author has obviously collected his material from many sources and offers a partial bibliography. The book is not absolutely complete or up to date in some particulars, but modern medicine moves so rapidly that few books really are. In general the book is one which can be recommended to all those interested in the assembling of information regarding health and hygiene.

The Nineteen Forty Mental Measurements Yearbook. Oscar Krisen Buros, Editor. Cloth. Price, \$6. Pp. 674. Highland Park, New Jersey: Mental Measurements Yearbook, 1941.

This large volume is the fifth of a series of books put out by the Department of Education at Rutgers University. These handbooks have been appearing biannually, and the present volume is a climax, for it is several times larger than the previous volumes in the series. There is little that is original in the volume, for it consists of an alphabetical listing of (1) intelligence, achievement and other educational and psychologic tests and (2) books which have to do with testing and the examination of the individual. The material included may have appeared prior to 1938, but most of it came out during the years 1938-1940. Each test is serially numbered, but the numbers begin not with 1 but with 1182, which follows 1181 in the previous *Mental Measurements Yearbook*. The book review serial numbers also begin where the previous issue left off. This is not a defect but merely keeps the listings consecutive with those of previous years. Each test is followed by rather extensive quotations from reviews which have appeared elsewhere. The reviews from *THE JOURNAL* and others having to do with medical, psychologic and educational matters are carefully culled in order to give as good evaluation as possible of the test materials. Psychologists wishing to learn about any test are, by use of this guide, in rather a good position to determine which one would be useful for a special purpose, provided they bring to bear on the problem the special training which the psychologist must have in evaluating his test equipment. A physician might find himself at a disadvantage in using the book because of the knowledge of psychologic literature, personalities and technics for which it calls. There is an extensive introduction, which is interesting because it evaluates the opinions of reviewers,

editors, test publishers and others relative to the validity of the reviews published in previous numbers. Periodicals are also listed alphabetically with their publishers and other important data, and the reviews coming therefrom are indexed under the listing of each periodical. There are extensive indexes covering both subjects and names; all in all, to those interested in mental testing, this is a most useful and comprehensive work.

Lachende Medizin. Worte und Scherenschnitte. Von Irene Schleicher. Boards. Price, 3.38 marks. Pp. 164, with illustrations. Leipzig: Georg Thieme, 1941.

The title of the book means "Laughing Medicine," but the reviewer did not even smile once while perusing it. No doubt the medical profession offers the humorist much material. Many of the best satirical poems about physicians were written by physicians, e. g. Oliver Wendell Holmes and Kussmaul. In order to make people laugh at a group of persons or a human institution, it is not sufficient, however, to bring platitudes into verses; one must have some gift of humor or irony. It is not humorous in itself to say that a "badearzt" (physician in a spa) likes to earn money and longingly waits for the summer guests. And a whole poem about specialists, as written in this book, says much less than the famous definition "A specialist is a man who knows more and more about less and less." From a purely literary point of view, the verses are outright bad, although the German language has been mistreated in the interest of the rhythmic form. With respect to the illustrations, the reviewer, who is no critic of art, feels that they do not enhance the humorous character of the book.

Fatigue and Hours of Service of Interstate Truck Drivers. By Benjamin F. Jones, Passed Assistant Surgeon, et al. From the Division of Industrial Hygiene, National Institute of Health. Prepared by Direction of the Surgeon General. Federal Security Agency, U. S. Public Health Service. Public Health Bulletin No. 265. Paper. Price, 40 cents. Pp. 286, with illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

The Interstate Commerce Commission under the Motor Carrier Act, 1935, is attempting to discover the relationship between hours of service and safe operation of vehicles. In the absence of existing factual information, the commission requested the U. S. Public Health Service to establish, if possible, at what measurable point fatigue of the cumulative type makes a truck driver a traffic risk. Data are compiled in the report based on several methods of estimating fatigue—subjective sensation of the driver himself, trained observation by physicians and others, and a series of performance tests based on physiologic and pathologic principles. Dependable correlation was observed in the case of speed of tapping, manual steadiness, simple reaction time and reaction-coordination time. These tests, therefore, were used as one basis for scoring results of observations. Physical examination alone apparently is not especially helpful. The present evidence affirms the common impression that limitation of driving hours will reduce fatigue, will improve efficiency of drivers and will contribute to highway safety.

Doctors Anonymous: The Story of Laboratory Medicine. By William McKee German, M.D. With an introduction by Paul de Kruif. Cloth. Price, \$2.75. Pp. 300. New York: Duell, Sloan & Pearce, 1941.

That passion for anonymity ascribed to pathologists in general is not characteristic of the author, who seems rather to be guided by the Arabic proverb "He that bloweth his own horn assuredly knoweth that it is well blown." His description of various laboratory methods of examination and his exposition of their significance in diagnosis and treatment might be a valuable contribution to the education of the laity were it not disfigured by reiterated, wholly unnecessary, slurs on his clinical colleagues and sneers at the ethics of the profession. The work is further marred by such gross errors as the statement that in 1876 in hospital obstetrics one third of all mothers died of puerperal fever and that the medical profession was satisfied with its 149 hospitals, that Crawford Long practiced in Alabama, that the American College of Surgeons requires 15 per cent necropsies or that the American Medical Association in 1939 approved 6,166 hospitals. One cannot but wonder whether the author's diagnostic reports are equally unreliable. The chapter on "Coroner's Thrombosis" may be commended without reserve.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

INCIDENCE OF CORONARY THROMBOSIS BY OCCUPATION

To the Editor:—Could you inform me as to the incidence of coronary thrombosis among white men doing manual labor as compared with those in confined occupations such as executive work?

T. E. Wilson, M.D., Jackson, Miss.

ANSWER.—There have been several notable studies on the incidence of coronary artery disease according to occupation. One of the earliest comprehensive studies was that made by Levy, Bruenn and Kurtz (*Am. J. M. Sc.* 187:376 [March] 1934). Their data, based on autopsy material, showed no significant preponderance of coronary disease among professional and executive persons. Master and his colleagues (*Am. Heart J.* 18:434 [Oct.] 1939) likewise find no difference in the incidence of coronary artery occlusion in three broad occupational groups: (a) workers and laborers, (b) clerks and business men, (c) professional workers. Unfortunately, their records did not routinely give sufficiently detailed information to separate out the executives in group b, but the substantial agreement between proportions of men in these three categories described among Master's patients and in the general population supports their conclusion that there are no marked occupational differences in coronary occlusion. Hedley (*Pub. Health Rep.* 54:972 [June 9] 1939) has analyzed data on acute coronary occlusion in Philadelphia during 1933-1937. He distinguished four groups

Estimated Mean Annual Death Rate per Hundred Thousand in Specified Age Period

	35-44 Yrs.	45-54 Yrs.	55-64 Yrs.	Total 35-64 Yrs.
Group a	47	109	475	154
Group b	37	150	304	140
Group c	36	147	357	128
Group d	29	124	253	107

of men: (a) professional men, (b) proprietors, managers and officials, (c) clerks and salesmen, (d) workers, all classes in this material and on the basis of estimates of the male population in the corresponding groups, has computed death rates from coronary occlusion in these groups, with the results shown in the accompanying table. Dr. Hedley's data relate to white men. While they show a higher rate in the professional and executive groups, the data are by no means free from the defects associated with diagnosis to which earlier reference has been made. Both Master's and Hedley's articles review the literature, and other references on the relationship between occupation and incidence of coronary thrombosis will be found in their papers. Another source of data which will be useful is the volume "Occupational Mortality" (published by His Majesty's Stationery Office, London, 1938) which is part IIa of Registrar General's Decennial Supplement, England and Wales, 1931. The chapter by Dublin in "Diseases of the Coronary Arteries and Cardiac Pain," edited by R. L. Levy (New York, Macmillan Company, 1936) may be consulted also.

GALVANISM FOR HEMORRHOIDS

To the Editor:—I have recently heard of the treatment of hemorrhoids and especially external hemorrhoids by the use of galvanism. Results are said to be excellent. I have not been able to find any literature on the subject. Has such a method of treatment ever been reported? If so, please give references.

M.D., Massachusetts.

ANSWER.—This query can be best answered by quotations. Warren R. Rainey of St. Louis, on page 2347 of "Modern Medical Therapy in General Practice" (edited by David P. Barr, published by Williams & Wilkins Company, Baltimore, 1940), states: "The use of galvanism in the treatment of hemorrhoids consists of exposing the hemorrhoid through a speculum and inserting a needle electrode into the upper part of the pile. The positive pole is connected to the needle and

the negative pole is connected to a moist pad either strapped to the abdomen or placed below the hips of the patient. The current is turned on gradually to 10 to 15 milliamperes. After about fifteen minutes the hemorrhoid distends and becomes black. One or two treatments a week can be given. The procedure, although carried out for a number of months, has failed to give satisfactory results in the author's experience."

Frank H. Krusen in "Physical Medicine" (published by W. B. Saunders Company, Philadelphia, 1941), page 337, states: "In the past, the galvanic current has been employed to a considerable extent for destruction of various buccal, vaginal and rectal lesions. Today it is rarely used for such purposes. For example, in 1934, Kallet reported that a survey conducted by the American Proctological Society indicated that employment of the constant current in the practice of proctology is very unsatisfactory and does not, as a rule, produce as good results as do other simpler methods of treatment. It is now generally believed that the procedure is not satisfactory as a treatment for hemorrhoids, although the procedure formerly had a number of advocates."

DIATHERMY BURNS

To the Editor:—Last June I treated a woman with diathermy by placing a pad on the back and one on the lower abdomen. She complained of a great deal of pain in the lower abdominal wall after the treatment and claimed that she sustained a burn. At no time was there even a blister or any scaling of the skin. There was, however, a redness of the skin after the treatment and later an area that had a slightly blanched appearance, and this was somewhat indurated. It was felt that she magnified any symptoms she might have. Can you give me an explanation as to what took place in the abdominal wall? Is it possible to get a burn of the deeper structures of the abdominal wall under such conditions without having a blister or slough?

M.D., New York.

ANSWER.—In the administration of medical diathermy it is not believed possible to create a burn in the deep tissues without a burn of the skin. After the described treatment there was redness of the skin and an area with a blanched appearance and induration. This might have been the preliminary evidence of a diathermy burn. If it was, in three to seven days there would be a necrotic area with a slowly separating slough.

More than four hundred experiments have been made in testing deep tissue temperatures on animals and dogs. In animals burns have been produced to measure the tissue injuries and the deep tissue temperatures. It has been concluded that when a limb is exposed to short wave diathermy the results indicate that the temperature of its tissues decreases from the skin, which is nearest the source of energy, toward the marrow of the bone. This thermal gradient from the surface to the interior of the limb is convincingly demonstrated by the fact that when the dosage was excessive the histologic damage of the tissues manifested a similar gradient of injury from the skin to the bone. This confirms previous observations on human subjects in which the temperature at different depths in the tissues from the skin to the periosteum has been determined after exposures of the thigh to short wave diathermy.

ULCERATIONS OF LEG IN DIABETES

To the Editor:—An elderly woman with diabetes of long standing had an amputation because of diabetic gangrene. On the remaining lower extremity there are two ulcers, one on the small toe and one on the large toe, which have been present for at least five months and have become somewhat larger. The diabetes is under control. The toes are bluish and slightly edematous. At present she is applying sulfanilamide powder directly to the ulcer and a continuous wet boric acid compress over it. The leg is kept under a baker, and peripheral vascular pressure is applied four times daily for one hour each time. The dorsalis pedis cannot be felt. I am naturally worried about gangrene setting in. Can you suggest any other form of treatment or medication to heal these ulcers?

M.D., New York.

ANSWER.—The ulcers in question are undoubtedly due to gross deficiency in blood supply to the extremity, as evidenced by the bluish color, absent dorsalis pedis and loss of the contralateral leg. Apparently acute infection is absent. The local application of sulfanilamide powder and boric compresses probably are of value from a prophylactic standpoint. Saturated magnesium sulfate compresses would be somewhat preferable to reduce the edema.

Unless a boot for passive vascular exercise is available there is no further treatment of value and the prognosis is poor. Amputation of the affected toes might be successful in the hands of a surgeon with much experience in this field, but the risk of infection and gangrene in the stumps must be considered. There is even more risk under the present conditions in the foot. Extreme caution not to burn the foot must be observed.

ULCERATIVE COLITIS

To the Editor:—A 9 year old boy has had chronic ulcerative colitis intermittently over a period of three years. Recent attacks have been associated with an acute respiratory infection. The attacks in the past have cleared up a month or so after the cessation of the respiratory infection. The patient was given sulfathiazole, a preparation of pectin and colloidal kaolin together with a high vitamin, high protein, low fat diet. General ultraviolet irradiation has also been used. The present attack began in March after an acute otitis media. *Staphylococcus aureus* was isolated from the affected ear. Roentgen ray examination of the chest was negative. Examination of the colon by means of a barium sulfate enema was reported negative for ulceration. Proctoscopic examination failed to visualize ulcers. Culture of the smear taken at the time of the proctoscopy showed a nonhemolyzing streptococcus, presumably *Streptococcus faecalis*. A recent blood examination showed 70 per cent hemoglobin, 4,188,000 red blood cells, 8,000 white blood cells, 58 per cent polymorphonuclears, 46 per cent small lymphocytes, 6 per cent eosinophils, with slight variation in size and shape of the red blood cells. The blood level of sulfathiazole at this time was 1.3 mg. per hundred cubic centimeters. On this date the patient had taken a total of 300 grains (20 Gm.) of sulfathiazole. The drug was discontinued three days later because of a febrile reaction and an increase in the number of stools. After three days the temperature returned to normal and has remained so. I have continued with the high protein, low residue, high vitamin diet, ultraviolet therapy and bed rest. The patient is having four to five loose, foul smelling, brownish stools a day. He has good appetite but tires easily. There is practically no pain attending the movement. The blood count on May 10 showed 75 per cent hemoglobin, 4,680,000 red blood cells, 10,200 white blood cells, 59 per cent polymorphonuclears, 37 per cent small lymphocytes, 2 per cent mononuclears and 2 per cent eosinophils. Sulfaguanidine therapy was considered. A survey of the literature would indicate this drug to be more effective in the acute febrile stage of dysentery. I obtained a supply of this drug for experimental use with the explicit understanding that the patient be hospitalized and daily examinations made of the blood and urine for detection of leukopenia, anemia or hematuria. I should like to have your opinion as to the treatment of chronic ulcerative colitis in general and as to the use of sulfaguanidine in this particular case. M.D., New York.

ANSWER:—As far as is known there are no methods available for a diagnosis of "chronic ulcerative colitis" except by visualization of lesions through the proctosigmoidoscope and by evidence obtained from roentgenologic examinations. It is clearly stated that the examination failed to reveal any lesions by either of these methods. One might ask then how a diagnosis of "chronic ulcerative colitis" was made. The various medications which have been used are some of those employed in the treatment of some forms of ulcerative colitis. Failure to respond to any of them might substantiate the suggestion that some other form of intestinal trouble is responsible rather than an ulcerative colitis. There are many other intestinal dysfunctions besides ulcerative colitis which are associated with a diarrhea such as is described. Sulfaguanidine has been used successfully in some forms of ulcerative colitis but would hardly seem justified without an accurate diagnosis of the nature of the intestinal disease at hand. A publication by Drs. H. M. Weber and J. A. Bagen, "Forms of Ulcerative Colitis," gives the most recent information on the classification of the various forms of ulcerative colitis.

PROBABLE PERNICIOUS ANEMIA

To the Editor:—A woman aged 71 presented, five years ago, a blood picture of 30 per cent hemoglobin (Sahli) and 2,400,000 red cells. There was increasing fatigue but no subjective or objective symptoms of pernicious anemia. On treatment with antianemia preparations by mouth she improved month by month, the hemoglobin rising to 70 per cent and red cells to 3,600,000 in eight months. Since then she has had a variety of iron and liver oral preparations, plus some injections of liver extract. At no time has the hemoglobin risen over 81 per cent or the red cells over 4,100,000. During the last year treatment has been chiefly ferrous sulfate, 5 grains (0.3 Gm.) three times a day. For the last six weeks the ferrous sulfate has been 30 grains (2 Gm.) daily. A recent red count shows hemoglobin 77 per cent, red cells 3,400,000 with a number of macrocytes and a few microcytes. The blood films have been inconclusive. There have been some macrocytes but no nucleated cells, no stippling or definite variations in shape. She feels well, and careful questioning reveals no symptoms of pernicious anemia, chronic blood loss, or systemic or focal disease. This seems to be an obscure or mixed type of anemia. No reticulocyte counts have been done. Can you classify the type? Are there any suggestions for diagnostic investigation? Would a trial course of intensive parenteral liver therapy be advisable? Would hydrochloric acid by mouth be helpful? M.D., Iowa.

ANSWER:—From the evidence available, the most likely diagnosis is pernicious anemia. In favor of this are the age of the patient, the presence of rather severe anemia which apparently responded to liver therapy, and partial relapse after liver was discontinued. The low color index seen originally may have been due to an associated iron deficiency.

If the patient has pernicious anemia, one would expect to find anacidity following histamine stimulation and an increase in the mean corpuscular volume. As an early sign of neural involvement is decreased vibration sense in the lower extremities; this should be carefully tested.

For a therapeutic test, one might give 1 cc. of concentrated liver extract (15 U. S. P. units) intramuscularly once a week

for about six weeks. If the red count increases to over 4 million this would be further evidence in favor of pernicious anemia. For maintenance, an injection every two weeks is usually sufficient. If the red cell count does not increase, the patient probably does not have pernicious anemia. In such an event thorough hematologic investigation is indicated (Osgood, E. E.: *Laboratory Diagnosis*, ed. 3, Philadelphia, Blakiston Company, 1940, p. 187).

As the patient is past the menopause and there is no chronic blood loss, further iron therapy is not necessary. Hydrochloric acid by mouth would not influence the blood picture.

MACULAR CHOROIDITIS

To the Editor:—Please give the most recent opinions as to the etiology and therapy of macular choroiditis. M.D., Pennsylvania.

ANSWER:—A special etiologic study of macular choroiditis has never been made, as far as has been determined, but in general the same causes which operate to produce endogenous uveitis in the anterior segment should be effective in the posterior, including its most vascular and highly metabolic part, the macular choroid. However, the fact that the iris and the ciliary body are in constant motion as are the heart, the lungs and the joints, and that the choroid is not may explain why many cases of fibroplastic iridocyclitis are seen and but few of exudative choroiditis.

Syphilis and tuberculosis are about the only well established causes of choroiditis. Vitreous opacity often makes it difficult to tell whether the lesion is primarily in the retina or the choroid in the early stages, and after a central choroiditis has taken its course the pigmented atrophic scars look just the same ophthalmoscopically as do those produced by the stretching and tearing of the choroid in so-called central myopic choroiditis. Salzmann has always taught that the one cannot be told from the other anatomically.

DERMATITIS FROM GOLD THERAPY

To the Editor:—What is the treatment for eczema following the use of sodium gold thiosulfate for arthritis in a woman 62 years of age? Her arthritis has improved. The eczema is most persistent behind the ears, where the scalp has remained dry and scaly. Other parts involved are the submammary and inner thigh regions. M.D., Pennsylvania.

ANSWER:—The condition described is more commonly called dermatitis than eczema. It would be interesting to know what dosage was employed for the patient. It has been shown that following gold therapy the gold salt is excreted slowly. This helps to explain the persistence of such an eruption. Certainly, the use of further gold therapy would be contraindicated.

As a rule, it will be found that emollient measures best serve the purpose in an eruption of this type, e. g. the use of boric acid ointment 5 per cent in petrolatum and hydrous wool fat.

Moreover, irradiation therapy by an expert is often of value in an eruption of this type; e. g., the use of the roentgen ray in a dose of 50 to 75 roentgens, unfiltered, to the areas involved once a week or once in two weeks for a series of three or four treatments may be all that is necessary to clear up this process, of course, using the local therapy in addition.

It has also been found that patients that have been on gold therapy are rendered photosensitive, so that the patient should be cautioned about getting out too much in the sun, at least for the next month to six weeks.

SIMPLE GLAUCOMA

To the Editor:—What is the latest approved medical or surgical treatment for simple glaucoma? M.D., Illinois.

ANSWER:—Each case of simple glaucoma is different from any other, and the treatment in each case depends on the reaction and tolerance of the eye in question. The first step is a careful recording of the three factors on which subsequent steps must be based; namely the central field of vision, the peripheral field of vision and the central visual acuity. The next step consists in the use of miotics as weak and as infrequently as is required to keep the tension within the range of the so-called normal. This calls for frequent measurements of intraocular tension, preferably at three hour intervals for several days. After the determination has been made as to the strength and frequency of use of miotics required to maintain a flat level curve of tension, the three vital factors should be measured at intervals of three to six weeks. As long as they can be maintained without loss, the treatment with miotics may be continued; but as soon as a deterioration occurs the miotics must be increased in strength and frequency or surgery must be

history of a primary attack of rheumatism. Of these, 142 (42.6 per cent) died within five years of their primary infection. In the future planning for the care of the child with rheumatic heart disease it is on this group that attention should be centered. They constitute the tragic aspects of the rheumatic state against which no specific measures have as yet been discovered. We are of the opinion that more prolonged care in the protected environment of the hospital, the sanatorium, the convalescent home or the foster home will do much to lower the mortality figures in these early critical years following the primary infection.

RACIAL DISTRIBUTION

In attempting to analyze the various races represented in the group of 1,438 children, we have eliminated those of mixed parentage, of whom there were a goodly number, 246 in all. The parents of these children made up a heterogeneous group of nearly every known country. The parentage of 35 children was not recorded. One thousand, one hundred and fifty-seven children (80.3 per cent) had parents of a similar racial stock. The Italians predominated, followed by Americans, Russians and Irish. Of the Americans, the Jewish race was represented by well over a majority. There were a few Negroes in the group.

ETIOLOGIC FACTOR

In a meticulous study of our records we find that the causative factor of carditis in 899 children (62.5 per cent) was rheumatic polyarthritis. One hundred and nine gave a history of chorea alone and 171 had had chorea and polyarthritis combined. We were left with a group of 212 children (14.7 per cent) in which there was no known cause. Many of these gave a history of "growing pains" only. It is significant to note that 55 of the latter group are now dead. This immediately confronts one with the problem that troubles every physician and pediatrician. What is the significance of "growing pains?" They are often difficult to interpret in the young, rapidly growing child. That the rheumatic pain should be differentiated from the non-rheumatic pain is obvious. Laboratory aid should be sought. The erythrocyte sedimentation test is often helpful. Observations by Hawksley² in England and Shapiro³ in this country would indicate that "growing pains" are not uncommon in healthy growing children and that in a very small percentage rheumatic carditis develops. The changes incident to growth in the epiphyses of the bone have been given as an explanation of these so-called growth pains. The most satisfactory explanation has been given by Erdheim.⁴ He states that in certain rapidly growing children minute fractures of the metaphysial plate occur. He has demonstrated these minute fractures at the growing ends of the long bones in children who have died of acute illness or by accident. The pains are usually referred to the knees, and the physician is told by the parent that the child will wake from a sound sleep complaining of a sharp pain in his knees.

When rheumatism is suspected, other laboratory aids besides the erythrocyte sedimentation test should

be done, such as the electrocardiogram, the white blood count, the Addis count on the urine, the Weltmann serocoagulation reaction⁵ and the fibrinolysin test.⁶ Differential diagnosis is most important, on the one hand to save the child from an unjustified invalidism and on the other to stay the progress of a crippling disease of the heart with an enforced invalidism and possibly a fatal outcome.

Many of the 212 patients with carditis for which there was no known etiology and who exhibited in many instances carditis of a severe degree presented none of the classic symptoms of rheumatism. It is this group that represents some of the minor patterns of the disease for which diagnosis is not easy. The child who tires easily, who unaccountably is losing weight, who has a poor appetite, who is becoming more pale and who has indefinite muscle pains with repeated nose bleeds should arouse the suspicions of the physician, and a careful survey and appraisal should be made. Mild types of chorea may be overlooked, and the physician should be on the alert in the knowledge that even mild chorea may be attended by severe carditis. A low grade fever and tachycardia may be discovered. Physicians too often err in thinking that rheumatism and joint infection are synonymous. Polyarthritis associated with rheumatism is not nearly as frequent in childhood as it is in later life. I am more and more impressed with the absence of joint symptoms in many of these rheumatic children, particularly in the early years. I wish to stress this point and emphasize some of the minor patterns that I have encountered in the early course of the rheumatic infection. These and the polymorphic character of the disease often make it extremely difficult to make a definite diagnosis. Having had the opportunity to observe closely such a large group of children in three convalescent homes, I find that in some of them a recrudescence of the infection may be ushered in by nothing more than a slight rise in temperature and tachycardia. Only by routine procedures in a carefully managed and controlled environment would these be discovered. This implies good nursing care, and these children have had the best. Such an observation has made it even more difficult in our follow-up of the child in the home to decide what constitutes reactivation. The burden of proof falls on the observer rather than on the one observed. All of which adds immeasurably to the complexity of rheumatic infection in childhood.

CARDIAC CLASSIFICATION

An analysis of our records indicates that 952 children (66.1 per cent) were admitted under the new classification of II B, while 423 children (28.9 per cent) entered the homes as III D. Of the latter group, comprising the children with more severe and long-standing heart disease, 244, or 57.6 per cent, have died. It would appear that this group (III D) has had but little benefit from convalescent care, and it is in this group of children that reactivations have occurred more frequently, and return to the hospital has been found necessary. I suggest from our experience that these 423 children who comprise 28.9 per cent of the total might have benefited from more prolonged bed rest in a sanatorium, on the same basis as children with tuberculosis. This would

2. Hawksley, J. C.: Nature of Growing Pains and Their Relation to Rheumatism in Children and Adolescents, *Brit. M. J.* 1:155 (Jan. 28) 1939.

3. Shapiro, M. J.: Nonrheumatic "Growing Pains" and Subacute Rheumatic Fever, *J. A. M. A.* 111:1960 (Nov. 19) 1938.

4. Antenucci, A. J.: Personal communication to the author, 1940.

5. Klein, R. I.; Levinson, S. A., and Rosenblum, Philip: Weltmann Reaction and Sedimentation Rate During Rheumatic Fever of Childhood, *Am. J. Dis. Child.* 59:48-66 (Jan.) 1940.

6. Boisvert, F. L.: The Fibrinolysin Test in Rheumatic Heart Disease, Society of Pediatric Research annual meeting, May 1940.

seem just as necessary for the rheumatic child in the subacute phase as for the tuberculous child. In future planning for the care of children with rheumatic heart disease under a state program adequate provision should be made for prolonged bed care in a sanatorium after discharge from the hospital. Following this, convalescent care, such as our group of children have had, should be continued when the quiescent stage of the rheumatic state has been reached. This might well be carried out in a foster home under the Speedwell Plan.⁷ This foster home care for cardiac children has been found to be most effective in several states.

MORTALITY

Those who are interested in rheumatic heart disease are eager to know the mortality rate in any given group in order to evaluate any given type of care. Our records show that over the period of twenty years, in the group of 1,438 children, there have been 431 deaths, a percentage of 29.9, or practically 30 per cent. This rate has risen gradually from 10.3 per cent in 1923 to 26.2 per cent in 1933, after twelve years of follow-up, to our present rate of 29.9 per cent. The latter figure would have been lower if the 244 deceased children representing the group with enlarged hearts and severe cardiac damage, the III D patients, had been excluded. The mortality in this group has been exceedingly high: 57.6 per cent.

Stroud and Twaddle⁸ give a mortality rate of 21 per cent in a group of 685 children who had received convalescent care at the Children's Heart Hospital of Philadelphia after a fifteen year observation. Jones,⁹ from the House of the Good Samaritan in Boston, reports a 24.2 per cent mortality among 1,000 patients, with an average ten year follow-up.

Others have pointed out that the greatest mortality occurs in the early years following the primary infection. As previously stated, 42.6 per cent of the deaths occurred within five years of the initial rheumatic infection. This means before puberty, for in our group the average age of the initial infection was between the sixth and the eighth year. Wilson, Lingg and Croxford¹⁰ in a published report give a mean of eight years. In a later report DeGraff and Lingg¹¹ state that "the average age at initial infection is seventeen years." After the adolescent period the tendency to rheumatic reactivations becomes less and less and our records show a diminishing mortality rate after the twentieth year. Eighty-seven per cent of the deaths have been of patients under 20 years of age, and the remaining 13 per cent of deaths have been of patients over 20 years.

Wilson¹² in her new book on rheumatic fever states: "So far as we may judge by our experience, it appears that at about the ages of puberty the tendency to manifestations of activity begins to diminish. It is, therefore, important to point out that the factor of age must be considered in evaluating any therapeutic measure in this disease." I wish to stress the latter point, for it

is my conviction that statistical data can be misleading in this disease unless multiple factors are taken into account.

An analysis of the 431 deaths has shown that the majority of children have died of their rheumatic infection and that more than two thirds have succumbed before their 16th year. We find that death from congestive heart failure has occurred more frequently in the older age group. In other words, we have not found that congestive heart failure as a cause of death is common in the age group up to 16 years. Most of these children have died from their rheumatic infection. Stress is made on this point because in any future planning for the care of rheumatic infection in children the frontal attack must be made in this younger age group and long term care given comparable to the care of tuberculosis, under trained medical supervision. We have been fortunate in obtaining from many scattered hospitals the final diagnosis in nearly all of the deaths, the one farthest away having occurred in Santo Domingo. In many cases the information was incomplete or inadequate, which impairs the validity of the statistical data. When autopsies have been done we have been able to get a complete protocol in nearly all cases, thanks to the cooperation of the pathologists in many hospitals. This has been invaluable in the completion of the life history of the rheumatic infection in these children. Our records show that the oldest patient who died was 34, death being due to congestive heart failure. Chronic glomerulonephritis with hypertension and uremia was not an infrequent cause of death.

LIVING PATIENTS

As complete as the follow-up on the deaths has been, we have been most fortunate in our follow-up on the 1,007 living children, many of whom are now adults. The living patients constitute 70 per cent of the total. Of this number we have maintained an active follow-up on 905, or 89.8 per cent, of whom 594 are still attending cardiac clinics and 303 are not. The decided success and effectiveness of the follow-up has been due to the most painstaking type of work, implemented by a high degree of enthusiasm, the results of which cannot be recorded in figures but are among the imponderables measured in services rendered to boys and girls, young men and young women crippled by rheumatic heart disease. Vocational guidance has been an important part of these services and has contributed in large measure to the number who are now in gainful occupations.

BIRTH DATA

We have been much interested in the number of children born to those who have married. Up to 1941, we have on our records 102 children born of 132 young men and young women who have been under our care as children. Ninety of the girls have been married, and 76 children (including 2 stillbirths) have been borne by these young mothers. Thirty-eight have had no children, 33 have had 1 child, 14 have had 2 children and 5 have had 3 children. Only 2 mothers died following childbirth, 1 from congestive heart failure and the other from postpartum septicemia. These excellent results attest for the good antepartum and obstetric care that the 90 young mothers have had in spite of their cardiac damage.

Of the 102 children born with 1 parent known to have had rheumatic heart disease, it will be of interest to follow this group into the second generation. If

7. Chapin, H. D.: Convalescent Care in Foster Homes, White House Conference on Child Health and Protection, New York, Century Company, 1930, pp. 92-98.

8. Stroud, W. D., and Twaddle, P. H.: Fifteen Years' Observation of Children with Rheumatic Heart Disease, *J. A. M. A.* **114**: 629-634 (Feb. 24) 1940.

9. Jones, T. D.: Heart Disease in Children, *Am. J. Pub. Health* **28**: 637-643 (May) 1938.

10. Wilson, May G.; Lingg, Claire, and Croxford, G.: Statistical Studies Bearing on Problems in the Classification of Heart Disease III. Heart Disease in Children, *Am. Heart J.* **4**: 164, 1928.

11. DeGraff, A. C., and Lingg, Claire: The Course of Rheumatic Heart Disease in Adults, *Am. Heart J.* **10**: 459-485 (April) 1935.

12. Wilson, May G.: Rheumatic Fever, London, Commonwealth Fund, 1940, p. 241.

one accepts Wilson's¹³ prediction table for childhood rheumatism, one should be able to "predict the probable occurrence of the disease in the progeny of a given mating." Up to the present we have been able to demonstrate rheumatic carditis in only 1 child born of a mother with rheumatic carditis. He is a boy now 6 years old. We have no further data to contribute to the interesting observations of Wilson in familial epidemiology.

TABLE 10—Occupations of Patients from Martine Farm, Reed Farm and Nichols Cottage in April 1941

Housewife	67	Laborer	6
House worker	14	Longshoreman	1
		Mechanic	6
Clerk	18	Machinist	2
Secretary	6	Cable worker	1
Stenographer	5	Bricklayer helper	1
Typist	7		
Comptometer	1	Painter	2
Accountant	1	Electrician, etc	5
Broker	1	Carpenter	3
Bookkeeper	6	Printer	4
Telephone operator	2	Glazier	3
Office worker ..	6	Glass blower	1
Key punch operator	1	Photographer	1
		Watchmaker, etc	3
Cashier...	3	Electroplater	1
Factory worker	13	Butcher	1
Machine operator	10	Florist	1
Dressmaker, etc	3	Examiner dry cleaner	1
Embroiderer	1	Newstand worker	1
Operator	1		
Artificial flower maker	3	Writer	1
Milliner	2	Journalist	1
Hat sprayer	1	Reporter	1
Hosiery worker	1	Teacher	1
Cutter ..	2	Recreation assistant	1
Furnier	1	Laboratory technician	1
Floor lady	4	Electrical engineer	1
Liner (instrument cases)	1	Optician	1
Plater's helper	1	Optical mechanic	1
Pipe factory worker	2	Optical setter	1
Bookbinder	1	Dental nurse	1
Cosmetic worker	1	Practical nurse	1
Textile firm worker	1	Ward attendant	2
Novelty worker	2	Model	1
Presser	1	Assistant manager of theater	1
		Store manager	1
		Draftsman	2
Shipping, stock clerk, packer	14	Chauffeur, taxi driver	7
Furniture store worker	1	Truck driver, helper	8
Worker at Macy's store	2		
Saleslady	3	U S Army and Navy	4
Worker in bookshop	1	CCC Camp	7
Clerk in store	6		
Window dresser	2	Lamp man (I R T subway)	1
Messenger	2	Push cart pedler	1
Delivery boy	4	Loft box dept worker	1
Newspaper route man	1	Inspector (parts)	1
Milk man	1	Terminal market worker	1
Transportation dept worker	1	Laundry worker	1
Hat checker	1	Battery boy	1
Salesman, buyer	6	Spray finisher	1
Advertising business	3	Sign painter	1
Barber, beautician	1	Cleaner of cars (subway)	1
Estimator	1		
Utility man	1		
Waitress	4		
Elevator operator	5		
Door man	1		
Total			357

OCCUPATION

Our most interesting study has been to determine how useful these boys and girls are to themselves and to the world in which they live. This must be the sine qua non of any therapeutic endeavor, and from the accumulated data one should be able to form some basis of opinion as to what constitutes optimum care for the child and young adult with rheumatic heart disease. Our records show that, of the 1,007 patients, 357 are regularly employed and 10 are irregularly employed. Eighty-eight are unemployed although able to work. Forty-four are unemployed and unable to work because of their heart condition. Two hundred and sixty children are in regular school and 2 are in a music school. Eighty-three attend a special class in

school for heart patients and 14 have a visiting teacher in the home. Thirty-six are unable to go to school and no visiting teacher has been provided. Thirteen children are not in school although able to attend. No data can be obtained from 102.

It has been of interest to review the various occupations in the 35.4 per cent of those regularly employed. They are mostly of a sedentary character. These occupations, as of April 1941, are listed in the accompanying table and may be of some import to those interested in vocational guidance. They cover the gamut of available jobs in New York.

MANAGEMENT

For the child with an active rheumatic infection prolonged bed care is necessary until the rheumatic process becomes quiescent. This would best be done in a sanatorium, as in the treatment of tuberculosis, or in the home or foster home under good medical and nursing supervision. Bland¹⁴ of Boston made an interesting five year study of this type of care and concluded: "Home and foster home care, when well organized, is adequate for the majority." Sanatorial care for the child with rheumatic carditis should follow the care in the hospital, which all too often discharges the child to his home with its bad hygiene, insufficient heat and crowding. Is it any wonder that reactivations occur so frequently? When all signs of activity have disappeared the state of convalescence begins. It is not easy, or always possible, to determine when this stage is reached. Herein lies the difficulty in deciding which children shall be eligible for convalescent care. This has been one of our chief problems.

PREVENTIVE TREATMENT

We have had no experience with chemoprophylaxis, but there is gathering evidence to the belief that the use of sulfanilamide in the quiescent stage of the disease does seem to prevent reactivation. The studies of Coburn and Moore¹⁶ have borne this out in a group of rheumatic children at Pelham Home. Also Kuttner¹⁷ at Irvington House has shown a definite decrease in the number of recurrences in the sulfanilamide-treated group of children as compared with a control group. The recently published studies of Thomas, France and Reichsman¹⁸ of Baltimore add further weight and evidence to the efficacy of this drug as a prophylactic agent in the rheumatic state. Mention should be made here of the studies of Swift¹⁹ and his associates, and those of Massell and Jones,²⁰ who showed that sulfanilamide is contraindicated in acute rheumatic fever and that toxic symptoms were almost universal. Although not indicated in the acute rheumatic process, sulfanilamide holds great promise for the future in the possible control of the disease and the lessening of reactivations. More data are necessary, especially in ambulatory patients in the lower age

14 Bland, E F. Rheumatic Fever in Childhood, New England J Med 224: 629-632 (April 10) 1941.

16 Coburn, A F., and Moore, L V. The Prophylactic Use of Sulfanilamide in Streptococcal Respiratory Infections, J. Clin Investigation 18: 147-155 (Jan) 1939.

17 Kuttner, Ann G. Observations on the Effect of Streptococcal Upper Respiratory Infections in Rheumatic Children. A Three Year Study, American Academy of Pediatrics, session I, New Haven, Conn., March 28, 1941.

18 Thomas, Caroline B., France, Richard, and Reichsman, Franjo. Prophylactic Use of Sulfanilamide in Patients Susceptible to Rheumatic Fever, J A M A 116: 551-560 (Feb 15) 1941.

19 Swift, H F., Moen, J K., and Hirst, G K. The Action of Sulfanilamide in Rheumatic Fever, J. A M A. 110: 426-434 (Feb 5) 1938.

20 Massell, B F., and Jones, T D. The Effect of Sulfanilamide on Rheumatic Fever and Chorea, New England J. Med 218: 876 (May 2) 1938.

groups. Before one can draw conclusions one must be mindful of the mutation in type and virulence of the hemolytic streptococcus from year to year.

TREATMENT OF CONVALESCENCE

The rheumatic child is best protected by insulating him, as far as possible, from contact with infections of the upper respiratory tract, especially those caused by the hemolytic streptococcus. This we have attempted to do in the three convalescent homes, and isolation technic has been practiced on any child coming down with a cold or sore throat. Herein lies the great value of sanatorial and convalescent care. In order to minimize carrier infection from the outside, only one parent each month was allowed to visit the home. Daily temperature and pulse recordings often detected rheumatic activity in its subclinical stage and served as helpful indexes. On admission the more severe class III D children were kept in bed for one week and the class I, class II B, class II C and potential heart patients for three days during a period of observation. When allowed to get up minimal activity was permitted. Rest was an important feature of the total care of these children, and they were in bed fourteen out of the twenty-four hours, twelve hours at night and a two hour rest period during the day.

An important part of the program in these homes is the educational one. We were fortunate in having outstanding teachers, and many children because of more individualized teaching were able to advance a grade on their return to their school in the city. Occupational therapy was made a vital part of the program. Wood carving, leather work, pottery, metal work, weaving and rug making were some of the many skills that the boys and girls were taught, and many perfected one or more of these to a high degree of proficiency. Numbers have turned their skill into a wage-earning occupation and have adjusted their physical capacity to their handicap. Music in the form of group singing and choral groups under a trained teacher was a part of the weekly program. This did much to relieve the monotony of a daily routine and served as a much needed emotional outlet. By the same token, dramatics were found to be an important medium to integrate the different personalities of the many nationalities.

COMMENT ON PUBLIC HEALTH ASPECTS

Our experience with such a large group of children with rheumatic heart disease, plus any data which we may have derived from convalescent care and a careful follow-up, leads one into certain generalities which are predicated on impressions rather than factual data. And again I would be remiss if I did not take into account the public health aspects of rheumatic fever, a problem of growing importance in our national life not only from the standpoint of morbidity and mortality but also from the standpoint of the national defense program. Until rheumatic fever is made a reportable disease there will be no accurate data. The incidence of rheumatic heart disease in this country is conservatively set at about 800,000 to 1,000,000 cases and a mortality rate of about 40,000 deaths a year with the average age at death 30 years. The incidence rate of rheumatic valvular lesions in children is about 0.7 to 1 per cent of the school population. We estimate in New York about 10,000 school children so afflicted. As they grow up they make up the greater number of adult heart patients in the second and third decades.

Another crippling disease of childhood is poliomyelitis. Because this disease has received so much attention from the public health authorities a comparison of the ravages of the two diseases is of interest and pertinent. The orthopedically crippled child, or the child crippled by infantile paralysis, arouses sympathy, and justly so, but when one considers that rheumatism destroys seven times as many children as does anterior poliomyelitis some conception of the ravages of rheumatic fever can be had. In one sense the child stricken with infantile paralysis is more fortunate than the child stricken by rheumatism. The latter confers little if any immunity, and reactivations occur all too frequently. In fact they are more often the rule than the exception. Each reactivation adds still further injury to a heart already damaged. On the other hand, infantile paralysis, as dread a disease as it is, usually confers an immunity to subsequent attacks, and the afflicted child may anticipate varying degrees of return of function. Many children who contract infantile paralysis recover completely with no resultant paralysis or crippling. Very few children who contract rheumatism escape without some damage to the heart of a greater or less degree. Our knowledge of the incidence rate of poliomyelitis is more accurate because it is a reportable disease. Because rheumatic fever is not reportable, except in a few states, there are no exact morbidity data.

In New York there are about 900 children with rheumatic heart disease applying to the hospital clinics each year. Besides this there were recorded, during the years 1936, 1937 and 1938, 681 deaths from rheumatic infection in children between the ages of 5 and 14 years. This exceeds the deaths from accidents during the same years in this age group and is two and a third times greater than the deaths from infantile paralysis (14), pulmonary tuberculosis (131), scarlet fever (45), measles (32), whooping cough (5) and diphtheria (55) combined.²¹ Hedley²² has made an exhaustive study of the disease in Philadelphia and has stressed the public health features in a series of reports. He states: "Rheumatic heart disease has a greater public health significance than any other form of heart disease. Both from the viewpoints of its age, distribution and its total mortality and morbidity it deserves to be ranked among the great unsolved medical problems of this era." The increasing interest of the United States Public Health Service in this disease and the development of state programs under the direction of the Children's Bureau with federal aid are all indications of progress and increasing public interest.

The public health aspects of rheumatic heart disease have been well elaborated by Swift.²³ He has described the London plan²⁴ of hospitalizing children with rheumatic fever, active rheumatic carditis and chorea for a period of at least six months. One bed to every 550 children is provided. Thus 900 beds have been set apart outside of London for the long term care of children under 16 years of age with active rheumatic carditis. No doubt the war has disrupted the well planned care for these children, but the plan, even though not now in operation, could well be emulated

21. Deaths from Certain Causes Among Children 5 to 14, New York Bureau of Records, Department of Health, 1936-1938.

22. Hedley, O. F.: Rheumatic Heart Disease: A National Health Problem, ninth annual meeting of Association of Life Insurance Directors of America, Oct. 20, 1938.

23. Swift, H. F.: Public Health Aspects of Rheumatic Heart Disease, J. A. M. A. 115: 1509-1518 (Nov. 2) 1940.

24. Thornton, C. E.: The London Scheme for the Treatment and Supervision of Juvenile Rheumatism, Acta rheumatol. 9: 10 (May) 1937.

by our large urban centers here in America. In New York alone Swift has estimated a need for 1,760 beds for this sanatorial type of care.

MENTAL HYGIENE

I cannot bring this paper to a conclusion without a word concerning the larger problem of the child who is crippled with rheumatic heart disease. It must not be forgotten that there is not only the heart to be treated but also the child who has the heart. In other words, attention to the psyche is quite as important as attention to the soma, and may be even more so. In the care of these children in the three homes we have tried to have an awareness of the child as a whole and have tried to remember that the handicapped child has a greater need for help and adjustment than the normal child. We have tried to instill the thought "I am getting well" rather than "I have been ill." It is all too easy to develop an "invalid reaction" in these children which in later years may become a neurosis with feelings of insecurity, inferiority and anxiety states. There are educational, social and emotional factors in the life of many of the children which often require special guidance. This is an area in the convalescent care of the cardiac child which has been woefully neglected.

Too many children labeled cardiac are being carried in heart clinics or taken care of by private physicians without justification. We have been asked to accept many of these for convalescent care. They have been condemned for years to a life of partial invalidism merely because of a cardiac murmur. This is indefensible. In my opinion, one of our most important functions as physicians is to weed out these children who are stamped as cardiac but who have no organic disease of the heart. They make up in later years the group of so-called "cardiac neuroses." In doubtful cases I would prefer to take a chance with certain of these children rather than subject them to a life of partial invalidism with its train of psychic maladjustments.

SOCIAL SERVICE

The social service aspects of the cardiac child is of the utmost importance. The vital role that the trained social worker plays in the total care of these children cannot be overestimated. She is an important link in their guidance and rehabilitation. Miss Terry,²⁶ medical social worker at the Massachusetts General Hospital in Boston, and Miss Ebert,²⁷ medical social worker at the Children's Mission to Children in Boston, have made important contributions to the medical and social care of these handicapped children. The special program that they have outlined provides for home and foster home care which includes adequate education, suitable recreation and occupational therapy.

We have found that one of the most important functions of the medical social worker is to prepare the home for the reception of the child on discharge from the convalescent home. When possible, an improved environment should be sought, for this is one of the most important safeguards in the life and prognosis of the rheumatic child. Improvement of the housing conditions in our large cities, with low rentals, will mean much to the future of children with rheumatic heart disease, the majority of whom come from families of the lowest economic level.

SUMMARY

1. During twenty years (1921-1941) 1,398 children with rheumatic heart disease (inactive) and 40 children with congenital heart disease have been given convalescent care in three country homes.

2. Of the 1,438 children, 431, or 29.9 per cent, are dead after a twenty year study.

3. Mortality figures after a two year study were 10.5 per cent and after twelve years were 26.2 per cent.

4. Forty-two and six-tenths per cent of the deaths occurred within five years of the initial rheumatic infection. Data were available on 333 children (77 per cent).

5. Eighty-seven per cent of the deaths occurred before 20 years of age.

6. The highest mortality, 57.6 per cent, was in the group of patients with polycyclic types with severe heart damage. These constituted the class III D patients. Reactivations occurred more frequently in these groups, necessitating return to the hospital.

7. Of the 431 deaths, 80 per cent were due to rheumatic infection and less than 1 per cent to congestive heart failure. The latter (40 deaths) occurred in the older age group, the oldest patient being 34.

8. Of the 90 girls married, 76 children have been born. Only 2 postpartum deaths have occurred. Of the 76 births there were 2 stillbirths.

9. The greater number of the 1,438 children were drawn from thirty-four clinics affiliated with the New York Heart Association. A lesser number were from twenty-three nonaffiliated clinics.

10. The average age of the initial rheumatic infection was from 6 to 8 years.

11. The average length of stay in later years has been between five and six months.

12. Of 1,007 living patients, an active follow-up has been maintained on 905, or 89.8 per cent.

13. Eight hundred and seventy-six patients are located in New York City or in New York State; 24 are living in nine other states and 5 in other countries.

14. Three hundred and fifty-seven patients, or 35.4 per cent, are regularly employed at gainful occupations; 10 have irregular employment; 260 are in a regular school; 83 are in a special class in school for heart patients, and 14 have a visiting teacher.

15. Three hundred and thirty, or 22 per cent, of the total 1,438 children were Italians. The two parents of 1,157 were of the same nationality and 246 had mixed parentage.

CONCLUSIONS

A true evaluation of the results of convalescent care for children with rheumatic heart disease is not possible without a comparable control group of children kept in their home environment. Such a group of children was not available or possible for this study. The validity of any conclusions depends on this.

Mortality figures were closely related to the severity of cardiac damage and were higher in the polycyclic types of rheumatic infection.

Future planning for children with rheumatic heart disease should provide prolonged bed rest and medical supervision, preferably in a sanatorium or foster home. This should follow care in the hospital. More beds should be provided for this purpose.

Convalescent care should be provided for a carefully selected group of children after the rheumatic infection

26. Terry, Edith M.: A Medical-Social Program for the Child with Rheumatic Fever, *New England J. Med.* 224: 632-634 (April) 1941.
27. Ebert, Virginia B.: Social Services to Children with Rheumatic Fever, *New England J. Med.* 224: 634-638 (April 10) 1941.

has become quiescent and should be carried on for at least six months. Optimum benefit has been observed in the monocyclic group with minimal cardiac injury.

In the convalescent care of the cardiac child, attention to the psyche is quite as important as attention to the soma. The two should be integrated. The educational program and occupational therapy are important adjuncts in the process of rehabilitation.

The role of the trained social worker and adequate nursing supervision are important in the home when the child returns from the convalescent home or sanatorium.

NOTE.—Many persons have given the better part of their lives to this significant undertaking. To them we here wish to pay tribute for their outstanding services to crippled children. More particularly we would wish to pay tribute to Miss Ada Beazley for her wise counsel and administration of the three convalescent homes throughout the twenty years. Also to Miss Eleanor Wilson for her outstanding services in the important social service and follow-up work. Likewise to Miss Mary Pascal for the laborious keeping and analysis of the records and for the compilation of statistical data for this paper. And lastly we wish to acknowledge our appreciation of the unique opportunity afforded in the care of children with rheumatic heart disease. This was made possible by the philanthropy of an always generous family. Without this financial help, the work could not have been undertaken, nor could this paper have been written.

107 East Eighty-Fifth Street.

ABSTRACT OF DISCUSSION

DR. WILLIAM D. STROUD, Philadelphia: Only those who have attempted to collect statistics of a similar group over a period of years can realize what an excellent job Dr. Martin has done. I sympathize with him in his dilemma as to whether we are justified in persuading philanthropic minded individuals to give money for such institutions. After some eighteen years' experience with a similar institution, the Children's Heart Hospital in Philadelphia, I have come to the conclusion, as the result mainly of recent developments in the preventive field, that such institutions should be carried on and that their numbers should be increased. This paper is timely, since the Children's Bureau in Washington has included children with rheumatic fever and rheumatic heart disease in their crippled children program, and I think that "rest homes" or "hospitals" are better terms than "convalescent homes," because we know that children, even after their treatment in such homes, have really not completely recovered from the disease. I believe the development of these rest homes will be the most expensive and most difficult part of the Children's Bureau program and at the same time is probably the most important part of that program. The ideal treatment of these children is first in the hospital for acute diseases and then in the rest home for as long a period as possible in order to prevent reactivations. There is hope, thanks to the work of Duckett Jones and others, that reactivations can be prevented much more frequently than they have been in the past, through lowering of the bacterial content of the air in these institutions. It may mean that these children will have to stay until puberty, if Dr. May Wilson's observations are correct that reactivations following that age are less frequent, but still many people have stayed in tuberculosis sanatoriums for many years, and perhaps that is going to be the ultimate treatment of these children. Then it is hoped that they will be able to leave the homes and, with sulfanilamide, if the recent work is confirmed, be protected against reactivations precipitated by hemolytic streptococci.

DR. A. L. VAN HORN, Washington, D. C.: Frequent reference has been made to the interest of the United States Children's Bureau in this particular field. The Children's Bureau is charged with the responsibility for the administration of the program of services for crippled children under the Federal

Social Security Act. At the present time, crippled children's programs are in operation in every state in the Union, Alaska, Hawaii, the District of Columbia and Puerto Rico. Recently a number of them have become interested in the field dealing with children with rheumatic heart disease. There are now on state registers some 300,000 crippled children, 97 per cent of whom are afflicted with orthopedic or plastic conditions. However, there is every reason to believe that there are perhaps an equal number of children in this country suffering from rheumatic heart disease or rheumatic infections. Recently, when we went before Congress asking for an additional appropriation for crippled children's services, we brought before the Senate Finance Committee the problem connected with children with rheumatic fever and rheumatic heart disease. An additional million dollars was appropriated, making the total appropriation for crippled children's services \$3,870,000 annually, and there was a distinct understanding at that time that part of the additional appropriation would go toward assisting states in developing services for children with rheumatic infections and rheumatic heart disease. After we received the appropriation we called in a group of physicians, many of whom are in this audience, and they recommended certain basic principles which should be followed in the development of these programs throughout the country. At the present time these special programs are in operation in eleven states but are not conducted on a statewide basis. We recognize the importance of having them developed around communities where there are adequate facilities and where the services of qualified medical specialists are available. In every instance the state agencies have been able to obtain the services of physicians who have had special training and experience in work with children with rheumatic infections. They also provide for the services of public health nurses, medical-social workers and others. This program deals with the entire field of the medical services for these children, locating and diagnostic services, hospital care, convalescent care and other after-care services. I feel that this program offers a real opportunity for the care of children with rheumatic infections.

DR. GEORGE J. FELDSTEIN, Pittsburgh: One of the important questions in the treatment of these convalescent cardiac patients is the benefit of climatic treatment. As is well known, rheumatic fever occurs mainly in cold, damp climates, as for instance in England. Rheumatic fever, as we know it, and streptococcal infections are relatively rare in tropical or subtropical climates. The United States Public Health Service, in conjunction with the Harvard group, several years ago sent a group of children convalescing from severe heart disease from Boston to Puerto Rico to test the effect of a subtropical climate. The children were later removed to the St. Francis Hospital at Miami Beach. The results were fairly good. Many mothers take their children to Miami for the winter and become stranded there. A group of philanthropically minded Miami people took up the care of these children while they were down there and got them in condition to send them back home. This became such a burden that a group headed by Mr. Charles Tobin developed the National Cardiac Home. They recently bought a 12 acre lot in North Miami opposite a public school, so that these children can go to a public school. They are now building a laboratory and twelve cottages to contain ten children each. If this experiment, which is to be conducted on a scientific basis with adequate research, proves that climatic treatment is of value it will constitute a great advance in the care of convalescent cardiac patients. Since there are 900,000 cases of rheumatic fever in the United States and there were thirty thousand deaths last year from rheumatic heart disease, it can easily be seen that this problem, considering its mortality, morbidity and crippling effects, is really a greater one than the after-care of children with poliomyelitis. These children are kept at the home for at least two years because it is felt that it is not the proper method of treatment to have these children in Miami during the winter and then send them back home during the summer. Of course, it may be argued that these children have to go back to the North anyway, some time or other, and

the question is whether or not it is wise to have them stay there two years and then go back to the more rigorous climatic conditions in the North. That problem remains to be solved.

DR. T. DUCKETT JONES, Boston: It seems to me that such data give one only the averaging up of the varied influences affecting the natural history of rheumatic fever. I doubt that we shall ever be able to determine the value of any special type of care by such analyses. This does not militate against the value of convalescent or any other type of care. For instance, we are all cognizant of the value of sanatorium care in the treatment of tuberculosis. To my knowledge, however, there has been no adequate proof of this with a careful series of controls. The very nature of the homes from which the majority of rheumatic fever patients come necessitates the placement of these children in the best locations for care available in a given community. The work of Dr. Coburn over a period of years and more recently the work of Dr. Ann Kuttner at Irvington House, together with published and unpublished work at the House of the Good Samaritan, indicate that we must accept the influence of infection with hemolytic streptococci as playing an important role in the natural history of rheumatic fever. This seems true regardless of what ideas one entertains as to the etiology of rheumatic fever. It further appears that the epidemiology of rheumatic fever in Northern cities closely follows the pattern of epidemics of at least some strains of beta hemolytic streptococci. We are therefore becoming more and more capable of evaluating the various types of care of such patients. The problem of the prophylactic use of the sulfonamide drugs and transportation of these patients to warm climates should remain experimental problems for the time being. Such varied factors must be considered as to render a detailed discussion impossible at the present.

DR. JOSEPH T. ROBERTS, Galveston, Texas: With Dr. George Herrmann during the past year, Dr. George Decherd and I have analyzed the autopsy and clinical data on cases of rheumatic heart disease in the University of Texas Medical Branch in Galveston. The cases analyzed were those for the past twenty years. We found, first, that rheumatic heart disease in all of its acute, chronic and complicated forms is by no means rare but, in fact, is rather common in southern Texas. Of course it is by no means as common as in other parts of the country, particularly in the North and along the Eastern seaboard. Second, about half of our patients were known to have acquired their disease in the northern part of this country or in Europe. However, some acute cases did develop in southern Texas. Third, the average age of death was 46 years, which is about twice the average age of death reported from Northern countries. Dr. Parsons of Texarkana reported at the Texas state meeting last week a careful study of 500 cases of heart disease in his private practice, studied in a small town community. He had many patients with rheumatic heart disease, and the average age of death of his patients was amazingly close to what we found. He found the average age of death in rheumatic heart disease patients in that northeastern Texas community to be 45 years. It is important to remember that all children with heart disease should be managed by the cardiologist in connection with the pediatrician. The child's heart functions on the same physiologic principles as does the adult's heart, and there is little reason for the old adage that children and adults react very differently to heart disease. The management of children with rheumatic heart disease should be a joint undertaking by the cardiologist and the pediatrician.

The Sulfonamides and the War.—It would probably be no extravagance to claim for the sulfonamide group of drugs, as was once claimed for the discoveries of Pasteur and Lister, that they will succeed in saving more lives than all the wars can kill. It would certainly not be rash to prophesy that during the period of the present war they will prove to have saved lives, relieved suffering and shortened periods of hospitalization on such a scale as to make previous advances in medicosurgical practice (excepting only those due to Pasteur and to Lister) appear small indeed.—Ryle, John A.: *The New Chemotherapy*, *Guy's Hosp. Gaz.* 55:222 (Sept. 6) 1941.

CARCINOMA OF THE STOMACH IN A LARGE GENERAL HOSPITAL

A COMPARATIVE STUDY OF TWO SERIES OF SURGICAL CASES FROM CHARITY HOSPITAL OF LOUISIANA AT NEW ORLEANS

FREDERICK FITZHERBERT BOYCE, M.D.

NEW ORLEANS

In 1900, in what was apparently the first favorable discussion before the American Surgical Association of surgery for carcinoma of the stomach, W. J. Mayo¹ argued that the disease was essentially surgical and that the mere suspicion of its existence was justification enough for the physician to request the surgeon to open the abdomen. Five years later, speaking before the same association, he² demanded that patients with carcinoma of the stomach be admitted directly to surgical wards, just as patients with carcinoma of the lip and of the breast were admitted directly to them, because the disease could be cured only by surgery and because more patients were dying from it than were dying after operation for it. He spoke with bitterness, for he had recently seen in a medical ward, under the charge of a distinguished internist, 10 patients with gastric carcinoma on whom surgery was not contemplated.

In 1941, thirty-six years later, Mayo's observations are still unhappily true. There are few hospitals, and certainly few general hospitals, in which the percentage of operability for carcinoma of the stomach is not small and in which the percentage of resectability is not far smaller. At Charity Hospital of Louisiana at New Orleans in the period extending from Jan. 1, 1922 to Jan. 1, 1941,³ 1,921 patients were treated for carcinoma of the stomach. Of that number, only 619 were submitted to surgery, and the nonsurgical deaths (366) outnumbered the surgical deaths (235) by more than 50 per cent. To reduce the figures to the simplest possible terms, of every 30 patients with carcinoma of the stomach at this institution only 10 are operated on, only 2 of the 10 are submitted to gastrectomy and only 1 of the 2 leaves the hospital alive (figs. 1 and 2).

In 1933 we analyzed in detail the 200 most recent surgical cases of carcinoma of the stomach at this institution,⁴ and since then we have frequently had the dubious though wholly deserved distinction of having our figures cited as probably closely approximating the true situation for the country at large.⁵ Unfortunately, the figures are entirely typical, and unfortunately the 200 most recent surgical cases from the same hospital do not present a much brighter picture (fig. 3). The immediate surgical mortality was slightly lower, it is true, and the proportion of resections was somewhat higher. On the other hand, the mortality for gastrectomy was practically stationary (at the appalling figure of approximately 56 per cent), and an

Read before the Section on Surgery, General and Abdominal, at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1. Mayo, W. J.: Malignant Diseases of the Stomach and Pylorus, *Tr. Am. S. A.* 18: 97-123, 1900.

2. Mayo, W. J.: A Review of Five Hundred Cases of Gastroenterostomy, Including Pyloroplasty, Gastroduodenostomy and Gastrojejunostomy, *Tr. Am. S. A.* 23: 168-181, 1905; discussion, p. 192.

3. The figures do not include the patients admitted between July 1, 1936 and July 1, 1937, for which period, because of a change in the record system of the hospital, accurate data could not be secured.

4. Maes, Urban; Boyce, F. F., and McFetridge, E. M.: The Tragedy of Gastric Carcinoma. A Study of 200 Surgical Cases, *Ann. Surg.* 99: 619-631 (Oct.) 1933.

5. Mullen, T. F.: Some Factors Influencing the Curability of Cancer of the Stomach, *Surg., Gynec. & Obst.* 72: 298-306 (Feb., no. 2A) 1941.

examination of the individual records discloses that the apparent improvement in resectability was due not so much to an increase in the number of resectable cancers as to an extension of the indications for resection.

The other participants in this symposium will present a very different picture, though they will probably be the first to admit that at that it is none too bright. Operation has been possible in approximately half of the cases of carcinoma of the stomach under treatment at the Mayo Clinic over a period of years, and resection has been possible in a very large number of the operable cases⁶ without, I am sure, such an extension of indications as accounted for the recent apparent improvement in this respect at the New Orleans Charity Hospital. In recent years, furthermore, the mortality of this operation at the Mayo Clinic has been reduced to what seems a truly irreducible minimum.

It is well to fasten one's eyes on the brilliant results of these and a few other institutions and surgeons and to endeavor to emulate them. But it should also be remembered that these results do not represent either the true incidence of resectable gastric carcinoma or

At Charity Hospital of Louisiana at New Orleans ~

of every 30 patients with carcinoma of the stomach,



only 10 can be submitted to surgery,



only 2 of the 10 can be submitted to gastrectomy,



and only 1 of the 2 leaves the hospital alive



Fig. 1.—Estimated operability of carcinoma of the stomach and estimated mortality of gastrectomy.

the true mortality of gastric resection. The real truth lies in the statistics that I have presented from the New Orleans Charity Hospital; in the 33 resections in 111 cases collected by Rippey⁷ from the Nashville hospitals, in which the mortality was 30.3 per cent; in the 24 resections in 148 operable cases reported from the Bellevue Hospital by Abrahamson and Hinton,⁸ in which the mortality was 58.2 per cent; in the 49 resections in 201 surgical cases reported by Sauer⁹ from the Lenox Hill Hospital, in which the mortality was 42.8 per cent; in the 19 resections in 120 cases reported by Oughterson¹⁰ from the New Haven Hospital, in which the mortality was 52.6 per cent—these are the true figures of carcinoma of the stomach because they are the unselected figures.

The patients operated on at the large private clinics of the country, as Abrahamson and Hinton point out,

are a selected group, selected first by the physicians who refer them to the clinics and selected even more strictly there by highly trained internists and surgeons. The social levels from which patients are derived also cannot be ignored. Foss¹¹ spoke only the truth when

At Charity Hospital of Louisiana at New Orleans—

of every 10 patients operated on for carcinoma of the stomach,



5 are submitted to palliative operations,



3 are submitted to exploration,



and 2 are submitted to gastrectomy.



only 1 of whom leaves the hospital alive.



Fig. 2.—Estimated distribution of surgical procedures in carcinoma of the stomach and estimated mortality of gastrectomy.

he explained the difference between his own proportions of resection and simple exploration (5 per cent and 57 per cent respectively) and Lahey's proportions in a similar series (25 per cent and 36 per cent respectively) as due to the different sources of the clientele; his own patients come chiefly from rural districts, whereas Lahey's come chiefly from urban districts.

Such differences help to explain the status of carcinoma of the stomach at the New Orleans Charity Hospital, where further difficulties are introduced by the large Negro population, approximately 45 per cent of

Two Series (200 cases each) of Surgical Cases of Carcinoma of the Stomach

From Charity Hospital of Louisiana at New Orleans ~

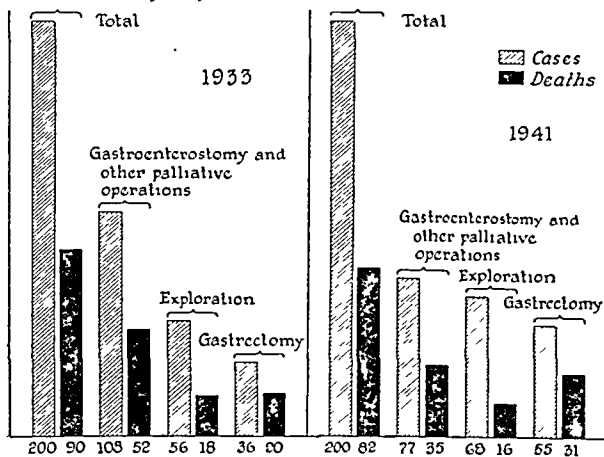


Fig. 3.—Two series of surgical cases of carcinoma of the stomach.

the total number of admissions. The Negro incidence of gastric carcinoma is disproportionately high at this institution; this race is notoriously indifferent to early signs of illness, and the problems introduced by the racial distribution only those who have treated Southern Negroes can possibly understand.

11. Foss, H. L., in discussion on Balfour.⁶

6. Balfour, D. C.: Factors of Significance in the Prognosis of Cancer of the Stomach, *Ann. Surg.* 105: 733-739 (May) 1937.

7. Rippey, E. L.: Cancer of the Stomach: Conclusions from a Study of 200 Cases, *South. Surgeon* 8: 359-372 (Oct.) 1939.

8. Abrahamson, R. H., and Hinton, J. W.: Carcinoma of the Stomach: Review of 444 Cases to Emphasize the Inadequacy of Present Methods for an Early Diagnosis, *Surg., Gynec. & Obst.* 71: 135-141 (Aug.) 1940.

9. Sauer, P. K.: Carcinoma Following Gastric and Duodenal Ulcer, *Ann. Surg.* 102: 995-1002 (Dec.) 1935.

10. Oughterson, A. W.: End Results in the Treatment of Carcinoma of the Stomach, *Yale J. Biol. & Med.* 4: 711-728 (May) 1932.

FACTORS OF MORTALITY

The distribution of operations in the second Charity Hospital series as compared with the first (fig. 3) reflects the changes which have come to pass in recent years in the surgical concept of carcinoma of the stomach. The increased number of gastrectomies, in comparison with the decreased number of gastroenterostomies, is a reflection of the conviction that gastroenterostomy has a very limited field and often is little more than a hopeless procedure which "enables the patient to live longer and suffer more," whereas gastrectomy, with only a slightly greater risk, offers a much greater prospect of temporary relief if not of permanent cure. The decreased number of gastrotomies and similar procedures is a reflection of the conviction that operations of this type are usually of very little help, especially in patients of the lower social levels, for whom postoperative feeding presents insuperable obstacles if they should survive long enough to be dismissed from the hospital.¹²

For the high death rate with which every type of operation, including simple exploration, was associated in both these series there are several possible reasons. Part of the mortality is undoubtedly to be attributed to technical errors and to poor surgical judgment. Part of it is undoubtedly to be attributed to the fact that the 400 operations were performed by sixty-two surgeons, in contrast to the concentration of gastric surgery in the hands of a small group of surgeons, which is the practice at most private clinics, and in sharper contrast to the suggestion of certain authorities that only a limited number of surgeons in each community should undertake gastrectomy. The most important reason for the high mortality, however, is that even when these patients are properly prepared for operation most of them still present very poor surgical risks. They have little resistance; they frequently have associated cardiac, cardiovascular and renal diseases and it does not take much to turn the tide against them, particularly when, as in gastric resection, the surgeon is working near the very limits of human endurance.

The question immediately arises, in view of the high mortality with which it seems always to be associated in large general hospitals, whether surgery for carcinoma of the stomach is justified. There are many reasons why the answer should be yes. One is that even in the most hopeless-seeming case there is still a gambler's chance that something can be done for comfort even if no real salvage is possible. The thesis is perfectly correct that no attempt should be made to keep the surgical mortality of gastric carcinoma at a low level by refusing to subject to exploration, and to radical resection if it is at all possible, the patients who are at the borderline of operability.

Another justification of the risk involved in surgery is the success that is sometimes achieved even in the most unlikely case. Charity Hospital has no follow-up system, and of the 41 patients who left the hospital alive after gastrectomy the status of only 20 is known. Thirteen of the 20 are known to have died within from twenty-four hours to four years after discharge from the hospital; one of these deaths was due to an acute cardiac state and another occurred after ventral hernioplasty, the patient having no evidence of a recurrent malignant condition. Two other patients were hopelessly ill when last seen. On the other hand, 5 are known to be alive and well at the end of eight

months, ten months, ten years (2 patients) and eleven years respectively after operation.

These results are probably as good as could be expected under the circumstances, for the circumstances were not favorable. The outcome of operation depends, first of all, on whether or not the growth has metastasized. There was clinical, operative or postmortem evidence of metastases in 153 cases in the first Charity Hospital series and in 150 in the second. When the disease has spread beyond the site of origin, as it is known to have done in 303 of these 400 cases (more than 75 per cent), relief can sometimes be effected but cure can never be achieved.

The ultimate justification for the risk of surgery in carcinoma of the stomach is, of course, that without operation the death rate in this disease is precisely 100 per cent. With one proviso, that the patient must have had the benefit of the best surgical judgment and surgical skill that is available, the surgeon need not reproach himself if operation fails. Under those circumstances, as Cheever¹³ has compassionately expressed it, he has been the agent of relief in whatever way relief may come.

THE PROBLEM OF DIAGNOSIS

As always in carcinoma of the stomach, the ultimate cause of every death in this series was related to the symptoms. The symptoms developed insidiously, they were ignored by the host, or the physician who was consulted failed to realize their possible gravity. When most of the patients were seen in the hospital, diagnosis required no particular astuteness, and a discussion of why the disease was not recognized earlier was usually water over the dam. A majority of the victims fell into the category which is always incorrectly and always regrettably termed classic; that is, the initial syndrome was completely lost in the final picture of emaciation, starvation, dehydration and toxemia. These are not the symptoms of carcinoma, they are its end results, and the only fact worth emphasizing about them is the almost unbelievable rapidity with which they often come to pass.

When the disease was traced back to its origin, there was practically no symptom or sign, initial or terminal, which was not represented in these 400 patients, including various kinds of indigestion and dyspepsia, epigastric distress, actual pain, anorexia, eructations, heart burn, dysphagia, nausea and vomiting, hematemesis, malaise, easy fatigue, dyspnea, loss of weight and masses in the epigastrium. Pain, which is not usually regarded as an early symptom of gastric cancer, was present in well over half the patients, but there was nothing constant about it except its presence. Often it was severe enough and continuous enough to overshadow earlier symptoms until the patient was specifically questioned about them. Loss of weight, which is also not an early symptom, was present in 85 per cent of the patients, 40 of whom had lost from 50 to 100 pounds (23 to 45 Kg.), often in periods of less than six months. Palpable masses, which again are not early manifestations, were present in 174 patients, 79 of whom died after operation. Other conditions that demonstrated how late was the hour included ascites, dilatation of the superficial abdominal veins, jaundice and dependent edema. Hiccups, which Welch¹⁴ listed as a significant

12. Walton, James: Carcinoma of the Stomach, *Brit. M. J.* 2: 1127-1132 (Dec. 9) 1939.

14. Welch, W. H.: *Cancer of the Stomach*, in *Operative, Williams, and Starr, Louis: A System of Practical Medicine by American Authors*, Philadelphia, Lea Brothers & Co., 1885, pp. 530-578.

though unusual symptom, were present in a number of instances and apparently deserve more attention than they receive.

Sometimes digestive symptoms were completely lacking or were so slight that they were elicited only when leading questions were asked about them. Sometimes the onset was abrupt, with obstructive vomiting or hematemesis or, in 1 instance, with perforation. It might be interpolated that this accident is not as unusual as it is ordinarily supposed to be, at least among patients of this social level; eleven perforations, nine of which were recent, were found among the 400 patients. Often the patient could trace the beginning of his illness to some particular and often very trivial circumstance. Thus 1 had never felt well since he had drunk a pint of cold milk, and another since he had drunk an excessive quantity of water. In some instances the indigestion was frankly of the qualitative type and the foods could be named which produced the discomfort. One patient throughout his illness, as in the case reported by Gaines,¹⁵ complained only of dyspnea and abdominal discomfort. Another patient had ignored his symptoms because he had had a similar attack eighteen years before, from which he had recovered without treatment.

Some patients dated their symptoms from an unrelated illness, usually influenza, from which they had never fully recovered. Whether their stories were correct or whether their symptoms became prominent then merely because their resistance was lowered is not possible to say. Sometimes intercurrent conditions overshadowed the symptoms of the cancer. Thus 1 patient had been under treatment for pulmonary tuberculosis, which he actually had. In 2 instances, digestive symptoms developed, or more probably became evident, when the patients were hospitalized, 1 for incision and drainage of an ischiorectal abscess, the other for prostatectomy, after which hematemesis occurred. Two patients had had full term deliveries, 1 a month and 1 a year before hospitalization; in each instance the symptoms of the cancer and the events of the pregnancy were hopelessly and fatally confused. Moynihan¹⁶ once stated that, as one read the histories of a series of patients with carcinoma of the stomach, one was driven to wonder whether all the patients could possibly have the same disease. The same wonder is logical as one considers the various syndromes presented by the patients in these two series.

A final group of patients, however, fell into a single category. In the combined series of 400 patients, 101, just over 25 per cent of the total number, presented histories more or less definitely suggestive of gastric ulcer. Sometimes there was no clearcut history of altered symptoms, sometimes there had been a recent alteration, which many times the patient, long used to digestive troubles, had entirely ignored. Whatever the course of events, the stories suggested the ulcer syndrome. Of this important group more will be said later, for in it is found the greatest chance of improvement in the end results of carcinoma of the stomach.

When these cases are analyzed from the standpoint of duration of symptoms, still further confusion is introduced. Symptoms had been present from one month to five years in the cases in which gastrectomy was performed and from a few days to twenty years in the remaining cases. Two hundred and twenty-five

patients, 182 of whom had inoperable cancers, had symptoms of less than six months' duration. That these figures represent the true duration of malignant disease is in the highest degree unlikely. Malignant disease does not develop in a few days, nor does it last for twenty years. Furthermore, it is paradoxical as well as depressing to contemplate the fact that patients who have been ill for a long time seem, on the whole, to have a better chance of cure than patients who have been ill for brief periods of time. The explanation of the paradox is obvious: rapidly growing, highly malignant tumors frequently make themselves evident before slowly metastasizing, less virulent tumors. The most important consideration of this phase of the discussion, however, is none of these things but rather the recollection that it is the realization of his symptoms rather than the fact of their presence which brings the patient to the physician. This is one reason why Negroes, who have a low threshold of sensibility, so often present inoperable disease.

Although the majority of the patients in both series were in the so-called cancer age (the range was from 21 to 79 years), 34 patients were between 30 and 40 and 4 others were between 21 and 29. In other words, approximately 1 in every 10 patients was under the age at which cancer is ordinarily looked for. As a matter of interest it might be mentioned that 25 of the 38 patients under 40 years of age were Negroes; our observations substantiate Gaither's¹⁷ statement that this disease develops at an earlier age in Negro than in white subjects. McNeer,¹⁸ in a collective study of cancer of the stomach in patients under 30 years of age, has recently pointed out that the high mortality usually associated with the disease in youth is due not so much to its inherent virulence as to the fact that the condition is seldom considered as a diagnostic possibility in young persons and the disease is therefore far advanced by the time surgery is undertaken.

The laboratory examinations in this study need no special discussion. Roentgenography was employed in every case in which it was not contraindicated, and gastroscopy was used in a fair proportion of the later cases in the second series. Both were correct for more than 95 per cent of the cases in which they were used, which is no tribute to the skill of the radiologist or to the possibilities of gastroscopy but merely additional evidence of the stage to which the disease had usually advanced. Most of the patients on whom gastric analyses were performed showed hypoacidity or anacidity, but a fair number had either normal acidity or hyperacidity. Most of the patients on whom blood studies were carried out had anemia, sometimes of an extreme degree even when the factor of hemorrhage was not present to account for it. Leukocytosis was observed in a certain proportion of cases, and the leukopenia observed in a small number may be an index of the degree to which this disease sometimes reduces the resistance of the host.

THE PROSPECT FOR IMPROVEMENT

How then, in the face of this confusion of symptomatology, is the status of carcinoma of the stomach to be improved at such an institution as Charity Hospital of Louisiana at New Orleans? The outlook, if one faces the situation honestly, is not encouraging. All the

15. Gaines, L. M.: Diagnostic Problem of the Causation of Dyspnea; Report of a Case with Autopsy, *J. A. M. A.* 104: 632-634 (Feb. 23) 1935.

16. Moynihan, B. G.: Cancer of the Stomach, *Practitioner* 121: 137-148 (Sept.) 1928.

17. Gaither, E. H.: Gastric Carcinoma: A Clinical Research: Pre-operative Course and Postoperative Results, *South. M. J.* 28: 107-114 (Feb.) 1935.

18. McNeer, Gordon: Cancer of the Stomach in the Young, *Am. J. Roentgenol.* 45: 537-550 (April) 1941.

odds are against success when one is dealing with patients, particularly Negro patients, in whom education in matters of health is always difficult and frequently impossible.

The outlook, generally speaking, would be vastly better if certain circumstances could be brought to pass. The problem would be largely solved if every person, at least over a certain age, could be induced to submit to routine physical examination and if roentgenologic studies could be made part of the routine; if gastroscopy could be employed as a routine to demonstrate possible gastritis, which is a presumably precancerous state; if gastric analysis could be employed as a routine to demonstrate lowered gastric acidity, which is supposed to be a precursor of the disease. These objectives, however, are utopian, and it is merely wishful thinking to believe that they can ever be achieved. The crux of the problem is first to catch the patient and then to detain him when he is caught, and neither of these aims is very often brought to pass. Unless symptoms direct attention to the stomach, gastroscopic examinations, roentgenologic examinations and gastric analyses are not likely to be made at all, let alone repeated, even on patients of the upper social levels and certainly not on the patients treated at large public hospitals.

The whole responsibility, therefore, devolves on the physician, whose task is threefold: 1. He must interpret such symptoms as the patient may complain of while they are still obscure. 2. He must refrain from the medical treatment of so-called functional indigestion and supposed peptic ulcer unless he is absolutely certain of the correctness of his diagnosis. 3. He must reduce the interval between the time he sees the patient and the time the surgeon operates on him.

1. The list of symptoms and signs present in these 400 cases of carcinoma of the stomach could, in their incipiency, have meant anything or nothing. Many of them were in no way indicative of the gravity of the underlying pathologic process, nor were they any more urgent than the symptoms of other, less fatal disease. One way to improve the present results in gastric cancer is to appreciate how serious they may be.

In the early stage of the disease nothing takes the diagnostic place of a carefully taken history, first as supplied voluntarily by the patient and later as dragged out of him by leading questions. Moynihan¹⁹ urges that the history take note "of the earliest departure from health of which the patient has knowledge," and Cooper²⁰ advises that it be secured "by carefully planned questioning regarding former dietary habits to contrast with the present reactions to food." Even with the most carefully interpreted history, however, diagnosis in the case which can be helped is usually based chiefly on suspicion. As Saltzstein and Sandweiss²¹ express it, the concept that mild indigestion after middle age unrelieved promptly by treatment warrants surgical exploration and, for so serious a condition as possible gastric carcinoma, must be grasped as a new clinical entity by most physicians before much headway in control will be evident. Unless suspicion is aroused, roentgenologic examinations, gastroscopic examinations and gastric analyses will not be undertaken. Exploration in the face of entirely negative roentgenologic films is not likely to be necessary very often if the examinations are properly made, are

repeated at frequent intervals and are interpreted each time by the same radiologist, who should also be of a suspicious nature. We have pointed out elsewhere⁴ that there is no warrant for the scorn with which some radiologists speak of the type of report which used to be returned almost as a routine: "This patient has a filling defect, the exact nature of which can be determined only by surgical exploration." It would profit a great many patients if their reports still carried the same explicit statement and the same implied warning, and if the admonition were generally heeded.

2. Definite improvement is possible in the group of patients—25 per cent of the combined Charity Hospital series and as large a percentage in many other reported series—who had a positive or possible history of gastric ulcer. That this number of patients actually had ulcers it would be folly to claim, but that is not the point. The point is that more than half of this group had treated themselves for ulcer, according to advice given daily and freely by radio, or had been treated for it by their private physicians or in the wards and outpatient dispensaries of the hospital.

These figures are not unique. They are duplicated in Oughterson's¹⁰ report, in Saltzstein and Sandweiss'²¹ report, in Cooper's²⁰ report and in Alvarez's²² illuminating study of how physicians conduct themselves when they have carcinoma of the stomach. Moynihan¹⁹ has listed as one of the causes of the high mortality of gastric cancer the success of the medical treatment of cancer which masquerades as ulcer, and his observation is wise. When treatment is successful, patients of the intelligent class are likely to slip away, and patients of the class treated at Charity Hospital are likely to slip away much faster. Many of the 101 patients in the ulcer history group in this series had been relieved by treatment, yet most of them had inoperable cancer, and 41 of them died in the hospital.

The ulcer-cancer argument has become extremely acrimonious, but as a matter of fact only two considerations are really important. One is that, once the transition from ulcer to cancer is admitted, the possibility is established, and debate over the proportion of cases in which the transition occurs is merely academic. The second is that in some cases there is no possible way of determining, short of surgical exploration and not always then, which supposed ulcers are really ulcers, which are cancers or which have become cancerous under treatment. The clinical, roentgenologic and laboratory evidence of ulcer is always proved unreliable when, as not infrequently happens, the victim dies of cancer. The law of averages is of small assistance when one is dealing with a single patient. He may be the 1 in 10 or the 1 in 100 against whom the cards are stacked, and a guess, as Moynihan¹⁹ has said in this connection, is "a poor peg on which to hang a man's life."

Physicians who undertake to treat supposed benign ulcers or supposed functional dyspepsia by medical measures must therefore be very sure of their ground, even if the treatment is only tentative. The therapeutic test is nowhere more precisely carried out than at the Lahey Clinic under the criteria devised by Jordan,²³ but such preciseness is by no means the general rule. Furthermore, time, which cannot be bought back, is always lost under medical treatment, however carefully

19. Moynihan, B. G.: *Essays on Surgical Subjects*, Philadelphia, W. B. Saunders Company, 1921.

20. Cooper, W. A.: *The Problem of Gastric Cancer*, J. A. M. A. 116: 2125-2129 (May 16) 1941.

21. Saltzstein, H. C., and Sandweiss, D. J.: *The Problem of Cancer of the Stomach*, Arch. Surg. 21: 113-127 (July) 1930.

22. Alvarez, W. C.: *How Early Do Physicians Diagnose Cancer of the Stomach in Themselves?* A Study of the Histories of Forty One Cases, J. A. M. A. 97: 77-83 (July 11) 1931.

23. Jordan, Sara M.: *A Review of the Gastric Ulcer Problem*, J. A. M. A. 107: 1451-1455 (Oct. 31) 1936.

it is administered, and the delay of a therapeutic test may be enough to transform a resectable growth into an inoperable one. Gastrectomy is always preceded by exploration, and exploration should not be deferred indefinitely. In gastric cancer there always comes a day when for the last time resection is possible and another day when for the first time it is impossible, but it is not given to either the physician or the surgeon to know when those days will come.

In this connection, another word of warning should be issued. Two patients in the Charity Hospital series entered the hospital complaining of the same symptoms for which shortly before they had been submitted to appendectomy through McBurney incisions and which were proved to be caused by cancer of the stomach. Ochsner²⁴ has personally observed 6 such cases. One way of improving the results of gastric carcinoma would seem to be to make the diagnosis of chronic appendicitis with very great caution in the so-called cancer years, and never to perform an appendectomy at this time of life through a McBurney incision.

3. Any improvement in the results of gastric cancer rest first with the patient. Until he presents himself to the physician no treatment is possible. Once he has sought medical advice, however, the responsibility becomes the physician's, who must turn him over to the surgeon without delay. In other words, as Hunt²⁵ expresses it (he is a surgeon who advocates gastrectomy to the limit of possible indications), the patient's hope of salvation lies not in the surgeon but in the medical man whom he first consults. Cooper²⁶ has recently demonstrated statistically the correctness of this observation, and my own series proves it, too.

The idea is not new. Welch,¹⁴ writing in 1885, called attention to it then. He was speaking of gastrectomy, of which his opinion was necessarily low, since it was based on 27 fatalities in 37 cases, when he said "It is therefore but a feeble glimmer of hope which is now admitted to the hitherto relentlessly fatal forecast of this disease. . . . These results are certainly not calculated to awaken much enthusiasm for the operation." It is highly significant that, feeling as he did, he should have continued: "The opinion entertained by the physician as to the propriety of surgical interference in gastric cancer is not . . . a matter of indifference, for cases of gastric cancer come first into the hands of the physician, and generally only by his recommendation into those of the surgeon."

In short, in what Mayo said in 1900,¹ in what Welch¹⁴ wrote in 1885, lies the clue to such improvement in the results of cancer of the stomach as we are likely to achieve in the present state of our knowledge. The basic problem, when once the patient presents himself to the physician, is how soon the physician turns him over to the surgeon, how soon the surgeon operates, on suspicion if he cannot positively eliminate the possibility of gastric carcinoma. I do not in any way desire to detract from the heavy responsibilities which are carried by the surgeon who operates for gastric carcinoma when I point out that, as matters now stand, the lessening of those two intervals seems, at least in public hospitals, to offer the greatest hope of improving the present tragic results in this disease.

SUMMARY AND CONCLUSIONS

Over a period of years only 2 of every 30 patients treated for carcinoma of the stomach in the New Orleans Charity Hospital could be submitted to gastrectomy, and the immediate mortality for this operation was more than 50 per cent. The 200 most recent surgical patients present very little real improvement over a similar series reported eight years ago. Most of the patients in both series had advanced disease, and this fact accounts chiefly for the high mortality and the poor end results. Figures such as these represent the true status of carcinoma of the stomach. An analysis of the series shows that in patients of this social level, many of whom are Negroes, improvement in results rests chiefly with the physician. He must accustom himself to suspect carcinoma in the most unlikely instances, to make the diagnosis on the history because in the earliest stages of the disease other methods are frequently not helpful, and to institute medical treatment for supposed gastric ulcer with the greatest circumspection, and only in patients who can be kept under constant observation. The most practical single method of reducing the mortality and improving the end results in carcinoma of the stomach is to shorten the interval between the time the patient first consults the physician and the time operation is performed—on suspicion if the possibility of malignant disease cannot be established in any other way.

837 Gravier Street.

MALIGNANT LESIONS OF THE STOMACH

IMPORTANCE OF EARLY TREATMENT AND END RESULTS

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In 1939 Livingston and Pack,¹ after a review of nearly a thousand articles dealing with the treatment of cancer of the stomach, assembled for examination reports from all parts of the world of 14,000 cases of cancer of the stomach in which gastrectomy had been performed. They were able to find at that time but 3,000 reported cases in which gastric resection had been performed by American surgeons.

Some of the most important questions to which they sought an answer were (1) the applicability of excisional surgery, or the percentage of the total number afflicted with the disease for whom extirpation is feasible; (2) the risks involved in efforts to remove the carcinoma, and (3) the effectiveness of gastrectomy when this can be successfully performed.

In an attempt to answer these questions as well as to classify all of our cases of cancer of the stomach in certain definite standard groups as suggested by Livingston and Pack, several members of the staff of the Mayo Clinic with the assistance of Dr. Everett B.

From the Division of Surgery, Mayo Clinic.

Read before the Section on Surgery, General and Abdominal, at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1. Livingston, E. M., and Pack, G. T.: End Results in the Treatment of Gastric Cancer: An Analytical Study and Statistical Survey of Sixty Years of Surgical Treatment, New York, Paul B. Hoeber, Inc., 1939.

24. Ochsner, Alton, in discussion on Gray, H. K.: Carcinoma of the Stomach, with Particular Reference to the Significance of Persistent Symptoms Ascribed to the Stomach and the Malignant Potentiality of Gastric Ulcers, J. A. M. A. 116: 22-24 (Jan. 4) 1941.

25. Hunt, V. S.: The Curability of Carcinoma of the Stomach, Canad. M. A. J. 36: 22-26 (Jan.) 1937.

Lewis² have reviewed all the cases of malignant lesions of the stomach seen in the years 1907 to 1938, inclusive. Sustained work over a period of more than two years by Dr. Lewis and ourselves with the cooperation of the Division of Biometry and Medical Statistics of the

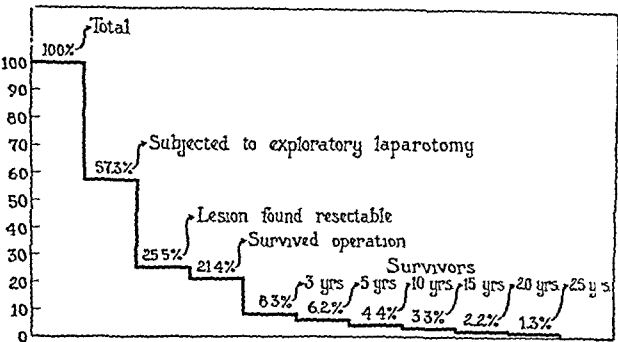


Chart 1—Survivals after operation among total patients observed who had carcinoma of the stomach

Mayo Clinic has enabled us to present a brief summary of some of the most important data³ (charts 1 and 2).

SYMPTOMATIC PICTURE

Although a little more than half of the patients presented what is commonly described as the usual picture of cancer of the stomach, which refers to a symptom complex in which dyspepsia is associated with various degrees of disturbance of gastric motility and various degrees of decline, approximately a third of the patients whose lesions were resectable had symptoms which included the so-called ulcer syndrome and in practically the same proportion this ulcer syndrome appeared as the first symptom (table 1). Of even greater importance was the fact that when patients who had this ulcer type of history were placed on a nonsurgical ulcer regimen 80 per cent had a temporarily effective response with relief from pain, suggesting, therefore, a benign ulceration.

ROENTGENOLOGIC DIAGNOSIS

Modern developments in the field of diagnosis, particularly roentgenologic, of lesions of the stomach

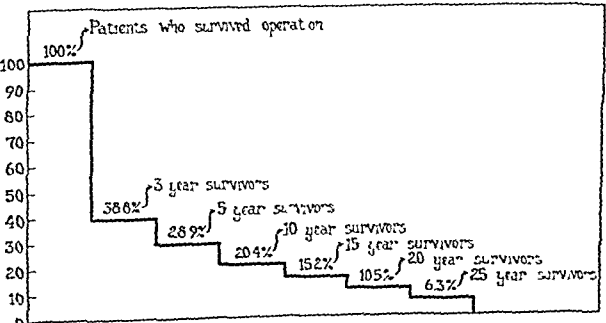


Chart 2—Survivals among patients in whom the lesion was successfully resected.

and duodenum have decreased the possible error in failing to demonstrate lesions in a low percentage of cases and, when added to this is the opportunity to

subject to gastroscopy patients who are believed to have gastric lesions which fail to show in the roentgenogram, this possible error is reduced further to a high degree. The fact remains, however, that there are some cases in which the roentgenologist is unable to determine whether the gastric lesion is benign or malignant, the roentgenologist's report in such a group of patients being that of gastric ulcer (table 2). It is in this group of cases, in which the lesion is a localized malignant ulcer, that advocates of a routine course of medical therapy may delay operation to a time when extension of the lesion or metastasis makes complete removal difficult and sometimes impossible. In our series of cases, although there was a failure to demonstrate the presence of a gastric lesion in but 1 per cent of the cases in which resection was performed, 10 per cent of gastric carcinomas were reported as gastric ulcers.⁴

In 1939,⁵ among 131 cases in which gastric resection was performed for malignant lesions of the stomach, the roentgenologist reported "gastric ulcer" in 9, or 7 per cent of the cases, and in all these an ulcerating adenocarcinoma or carcinomatous ulcer was found at operation. In 3 of the 9 cases in which the lesion was

TABLE 1.—Carcinoma of the Stomach, 1907-1938: Type of Symptomatology

First Symptom	Resection		Palliative Operation and Exploration		Total	
	Num ber	Per Cent	Num ber	Per Cent	Num ber	Per Cent
Dyspepsia	1,370	49.4	1,873	54.0	3,243	52.0
Ulcerous	916	33.0	820	24.6	1,736	27.8
Decline	187	6.7	315	9.1	502	8.0
Hemorrhage	26	0.9	76	2.3	102	1.6
Other	273	9.8	406	12.7	679	10.9
Total	2,772	100	3,470	100	6,242	100

reported as "gastric ulcer" there was a malignant lesion of grade 4 (Broders' method), in 3 of grade 3, in 1 case of grade 1 and in 2 cases grading was not done.

RESECTABILITY

In many instances roentgenologists at the clinic have attempted to progress even further in their efforts to aid the clinician and have expressed an opinion as to the operability of the lesions which they see roentgenologically. Of the cases in which surgical exploration was undertaken, although the lesion was considered roentgenologically to be inoperable or of doubtful operability, the lesion in 20 per cent proved to be resectable. With recognition of this error of interpretation in recent years the percentage of patients who have been subjected to exploratory operation for cancer of the stomach has increased progressively, and likewise the rate of resectability has increased, the latter because of the willingness to remove, if possible, every malignant gastric lesion that has not metastasized to regions from which it cannot be removed.

2. Former fellow in surgery and first assistant, Mayo Foundation for Medical Education and Research.

3. Walters, Waltman; Gray, H. K.; Priestley, J. T.; Lewis, E. B., and Berkson, Joseph: Malignant Lesions of the Stomach: Results of Treatment from 1907 Through 1938 (Preliminary Report) Proc Staff Meet., Mayo Clin. 15: 625-638 (Oct. 2) 1940.

4. Priestley, J. T.: Report on Surgery of the Stomach and Duodenum, 1939. Duodenal Ulcer, Proc Staff Meet., Mayo Clin. 15: 707-709 (Nov. 6) 1940. Gray, H. K.: Report on Surgery of the Stomach and Duodenum, 1939, Gastric Ulcer, Proc Staff Meet., Mayo Clin. 15: 710-711 (Nov. 6) 1940.

5. Walters, Waltman: Report on Surgery of the Stomach and Duodenum, 1939; Malignant Lesions of the Stomach, Proc. Staff Meet., Mayo Clin. 15: 712-717 (Nov. 6) 1940. Priestley, J. T.; Gray, H. K.

TREATMENT AND RESULTS

Mortality Rate.—Fifty-eight per cent of the 11,000 patients for whom diagnosis of malignant lesion of the stomach was made at the clinic between the years 1907 and 1938, inclusive, were subjected to surgical explora-

TABLE 2.—*Carcinoma of the Stomach: Cases in Which Resection Was Performed; Roentgenologic Diagnosis of Lesion*

Roentgenologic Diagnosis	Patients	Per Cent
Carcinoma .. .	1,859	75.3
Gastric lesion unspecified	319	12.9
Gastric ulcer	245	9.9
Benign lesion	21	0.9
No lesion	25	1.0
Total	2,469*	100

* Three hundred and three of the total 2,772 patients on whom resection was performed had no roentgenologic examination

tion in the hope that removal of the lesion would be found possible. In 45 per cent of this group of cases the lesion was removed, which is 26 per cent of the original total group observed. The average mortality rate for the 1907-1938 series of cases in which resection was done was 16 per cent.

In 1940,⁶ 260 patients were operated on for malignant lesions of the stomach and these constituted 53 per cent of those on whom a diagnosis of malignant lesions of the stomach had been made. Partial gastrectomy was performed in 117, or 45 per cent of the cases in which operation was performed, and total gastrectomy was performed in 8 cases. For the combined group of partial and total gastrectomy the hospital mortality rate was 8.8 per cent.

In the 1907-1938 series in many cases of inoperable cancer palliative operations, such as gastroenterostomy, were performed and in these cases the average hospital mortality rate was 12.3 per cent. This emphasizes the high risk of palliative procedures for irremovable malign-

TABLE 3.—*Carcinoma of the Stomach, 1907-1938: Cases in Which Resection Was Performed*

Age, Years	Patients and Hospital Deaths by Age and Sex									Total
	Men			Women						
	Pa tients	Hospital Deaths		Pa- tients	Hospital Deaths		Pa tients	Hospital Deaths		
		Num ber	Per Cent		Num ber	Per Cent		Num- ber	Per Cent	
20-29	14	0	..	10	0	..	24	0	..	
30-39	133	9	6.8	50	1	2.0	183	10	5.5	
40-49	421	47	11.2	142	7	4.9	563	54	9.6	
50-59	780	134	17.2	211	30	14.2	991	164	16.5	
60-69	647	147	22.7	185	32	17.3	832	179	21.5	
70+	128	30	23.4	51	13	25.5	179	43	24.0	
Total	2,123	367	17.3	649	83	12.8	2,772	450	16.2	

nant lesions and points to the need of caution in the employment of such conservative and palliative procedures, unless the lesion is producing almost complete obstruction.

MORTALITY RATE AS RELATED TO AGE

The hospital mortality rate for younger patients was considerably lower than for older patients. Among 24 patients in the age group from 20 through 29 years

who underwent resection no deaths occurred (table 3). The mortality rate among 183 patients in the age group from 30 through 39 years was 5.5 per cent and among 563 patients between 40 and 49 years it was 9.6 per cent. In the age group from 50 years upward the mortality rate increased progressively by decades, being 24 per cent among 179 patients aged 70 years or more. The average mortality rate in the 2,772 cases of resection for carcinoma of the stomach for all age groups was 16 per cent.

TYPES OF OPERATIONS

Generally speaking, the most frequent type of operative procedure in cases of gastric carcinoma was the posterior Polya resection, 1,264, or 46 per cent, of the 2,772 resections having been of this type. This type of operation has been, and continues to be, the most generally used in cases of partial gastrectomy.

The anterior Polya-Balfour method was used in 659 cases, or 24 per cent; the Billroth II was used in 437 cases, or 16 per cent, and the Billroth I was used in 170 cases, or 6 per cent. Segmental resection and local excision of the lesion were performed in 215 cases and total gastrectomy in 27 cases.

TABLE 4.—*Survival Rates in Cases of Carcinoma of the Stomach in Which Resection Was Performed*

Period After Leaving Hospital, Years	Patients Who Survived Operation		Survived Beyond Indicated Period		Survival Rate Adjusted for Normal Death Rate, per Cent
	Total	Traced	Patients	Per Cent of Traced Patients	
5	1,968	1,951	564	28.9	32*
10	1,585	1,557	317	20.4	
15	1,053	1,033	157	15.2	
20	630	620	65	10.5	
25	303	302	19	6.3	

* Survival rate beyond five years approached that of the normal population

The Billroth I operation has been used less frequently in this country than abroad in the treatment not only of malignant lesions but also of benign lesions of the stomach and duodenum. Some of the reasons for this, among others, are that the operation can be applied to a relatively few patients and in the mind of some seems to carry a higher operative risk than that of the indirect type of anastomosis used in the Polya resection. However, it is an interesting fact that for the series in this study the mortality rate for the Billroth I type of operation was the lowest in the series, being 11.2 per cent in the 170 cases, whereas the mortality rate for the posterior Polya was 15.2 per cent in 1,264 cases. In studying survival rates, the Billroth I method also stands out as an excellent procedure. One of the reasons for the lower mortality rate for the Billroth I type of resection is that it usually is applied only in cases in which the lesions are reasonably small and occupy the lower third or the lower half of the stomach and in cases in which there is sufficient motility of the duodenum so that the remaining portion of the stomach can be approximated to the duodenum without tension.

SURVIVAL RATE

In studying the survival rates according to the type of operation it is an interesting fact that 34.8 per cent⁷ of those patients who were subjected to the Billroth I

⁶ Walters, Waltman; Gray, H. K., and Priestley, J. T. Unpublished data.

⁷ Without adjustment for normal death rate. See corrected figures in next paragraph.

operation lived five or more years after leaving the hospital, whereas 28.9 per cent⁷ of those subjected to the posterior Polya operation lived five years or more after leaving the hospital. The five year survival rate for patients who had been subjected to the anterior Polya-Balfour procedure was slightly lower.

The five year, ten year, fifteen year, twenty year and twenty-five year survival rates are shown in table 4. The rates concern those patients who did not succumb to the operation; that is, deaths in the hospital are not included. All deaths, from whatever cause, which occurred after patients left the hospital are included, and since the normal death rate for a group of persons of the ages of these patients is considerable, a more nearly true picture of the mortality rate for carcinoma of the stomach is obtained if the rates are adjusted for the normal death rates. The five year survival rate for those patients who underwent resection is 29 per cent, and when this is adjusted for the normal death rate it is 32 per cent. The ten year survival rate is 20 per cent, and when it is adjusted for the normal death rate it is 25 per cent. The fifteen

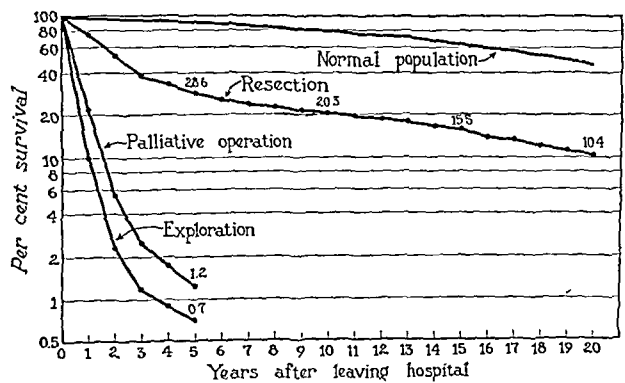


Chart 3.—Survival rates after leaving hospital compared with those of normal population. Survival rates are plotted on a logarithmic scale, so that the slope gives the death rate at any particular time and allows for direct comparison of curves.

year survival rate was 15.2 per cent,⁸ twenty year rate 10.5 per cent and the twenty-five year rate 6.3 per cent.

Survival Rate According to Metastasis and Extension.—In 1,968 cases in which resection was performed the factors of glandular metastasis and extension were studied to determine their effect on the prognosis. Of the patients who did not have extension or glandular metastasis, 44.7 per cent lived five years after leaving the hospital. Of the patients who had direct extension of the lesion to adjacent tissue, 39.1 per cent lived five years. Of the patients who had glandular metastasis, 17.3 per cent lived five years, and of those who had glandular metastasis and direct extension the five year survival rate was practically the same (table 5).

Survival Rate in Relation to Degree of Malignancy.—Broders' index of malignancy for many years has been a most reliable measuring stick and its accuracy is borne out in the present study. The five year survival rates after resection were as follows: 86.2 per cent in cases in which the lesions were grade 1, 58.8 per cent in cases in which the lesions were grade 2, 30.2 per cent in cases in which the lesions were grade 3 and 23.3 per cent in cases in which the lesions were graded 4 (table 6).

8. Survival rate beyond five years approaches that of the normal population (chart 3).

Survival Rate as Related to Age.—It is believed commonly that malignant lesions as they occur among younger patients are of a more fulminating character than those which afflict older persons and that, therefore, the results of treatment of carcinoma among

TABLE 5.—Five Year Survival Rates According to Metastasis and Extension in Cases of Carcinoma of the Stomach in Which Resection Was Performed

	Patients Who Survived Operation *		Lived Five or More Years After Leaving Hospital	
	Total	Traced	Number	Per Cent of Traced Patients
No metastasis present				
Growth limited to stomach.....	502	409	223	44.7
Growth extended to other organs....	421	417	163	39.1
Glandular metastasis present				
Growth limited to stomach.....	451	446	77	17.3
Growth extended to other organs....	594	589	101	17.1
Total.....	1,968	1,951	564	28.9

* Inquiry as of Jan. 1, 1940. Included here are patients operated on five or more years prior to time of inquiry; that is, 1934 or earlier. Hospital mortality is excluded in the calculation of survival rates.

younger patients are considerably poorer than the results obtained for patients of the older age groups. In our study the five year survival rate was calculated according to the age of the patient at the time of operation. It was found that for patients less than 40 years of age (table 7) the survival rate was 25.1 per cent (26.0 per cent when adjusted for the normal death rate), in contrast to the survival rate of 29.7 per cent for patients who were 40 to 49 years of age (31.2 per cent when adjusted for the normal death rate). The five year survival rate for patients 50 to 59 years of age was 29.2 per cent (32.2 per cent when adjusted for the normal death rate), the rate for patients 60 to 69 years of age was 28.9 per cent (35.8 per cent when adjusted for the normal death rate) and that for patients 70 years or older was 29.8 per cent (49.3 per cent when adjusted for the normal death rate).

TABLE 6.—Carcinoma of the Stomach: Five Year Survival Rates According to Grade of Malignancy (Broders' Method) in Cases in Which Resection Was Performed

Grade of Malignancy	Patients Who Survived Operations *		Lived Five or More Years After Leaving Hospital	
	Total	Traced	Number	Per Cent of Traced Patients
1	29	29	25	86.2
2	190	187	110	58.8
3	316	315	95	30.2
4	270	269	62	23.3

* Inquiry as of Jan. 1, 1940. Included here are patients operated on five or more years prior to time of inquiry; that is, 1934 or earlier. Hospital deaths are excluded in the calculation of the survival rates.

SARCOMA OF THE STOMACH

In the series of 6,352 patients who were operated on for malignant lesions of the stomach, in 110 the lesion was sarcoma. Of this number sixty-eight resections were performed with a hospital mortality rate of 13.2 per cent, whereas palliative operations were performed with a hospital mortality rate of 14.3 per cent. These mortality rates closely approximate those

for carcinoma. The interesting difference between sarcoma and carcinoma is apparent in the distribution for age, since 24.5 per cent of the patients who had sarcoma were less than 40 years of age whereas but 6.9 per cent of those who had carcinoma of the stomach were less than 40 years of age.

SUMMARY

Approximately a third of the patients who had carcinomatous lesions of the stomach which were resectable had symptoms of so-called ulcer type of dyspepsia and in four fifths of such cases a temporarily effective response with relief of pain occurred when the patient was placed on a medical ulcer regimen. It is apparent, therefore, that an effective response to medical treatment of the ulcer does not exclude the presence of a malignant lesion in the stomach.

Accurate roentgenographic examination revealed the presence of a gastric lesion in 99 per cent of the series of cases presented, although in but 75 per cent of the cases was a diagnosis of "cancer" of the stomach made, and in approximately 10 per cent of the cases the lesion

The average mortality rate was 16 per cent in the cases of gastric resection for malignant disease. The mortality rate in 1939 in the 125 cases in which partial gastrectomy⁹ was performed was 10.4 per cent, and in 117 cases in 1940 it was 8.5 per cent.¹⁰

The five year survival rate after resection was 29 per cent, and when adjusted for the normal death rate it was 32 per cent. The ten year survival rate was 20 per cent, and when adjusted for the normal death rate it was 25 per cent. The fifteen year survival rate was 15.2 per cent,¹¹ twenty year rate 10.5 per cent and the twenty-five year rate 6.3 per cent. Survival after the ten year period of patients on whom resection had been performed closely parallels the normal survival rate for persons of similar age groups.

Broders' index of malignancy has proved to be an accurate method of determining the degree of malignancy, a fact which was borne out in the comparison of survival rates of patients characterized by different degrees of malignancy.

Of patients who did not have extension or metastasis, 44.7 per cent lived five years after leaving the hospital; but when metastasis was present only 17.3 per cent of the patients lived five years.

A large number of patients less than 40 years of age who had cancer of the stomach were operated on with considerably lower mortality rate than the average of the series and the five year survival rate was 25.1 per cent, in contrast to the survival rate of 29 per cent for patients of all ages.

In 110, or 1.7 per cent of the cases in which operation was performed, the lesion was sarcoma. Sixty-eight resections were performed for sarcoma of the stomach with a mortality rate of 13.2 per cent. However, 24.5 per cent of the patients who had sarcoma of the stomach were less than 40 years of age, whereas but 6.9 per cent of those who had carcinoma of the stomach were less than 40 years of age.

TABLE 7.—Carcinoma of the Stomach: Cases in Which Resection Was Performed; Five Year Survivals According to Age

Age, Years	Patients Who Survived Operation *		Lived Five or More Years After Leaving Hospital		Survival Rate Adjusted for Normal Death Rate, per Cent
	Total	Traced	Number	Per Cent of Traced Patients	
Less than 40	174	171	43	25.1	26.0
40-49	439	434	120	29.7	31.2
50-59	715	710	207	29.2	32.2
60-69	536	532	154	28.9	35.8
70+	104	104	31	29.8	49.3
Total	1,968	1,951	564	28.9	31.9

* Inquiry as of Jan. 1, 1940. Included here are patients operated on five or more years prior to time of inquiry; that is, 1934 or earlier. Hospital deaths are excluded in the calculation of the survival rates.

was reported as a "gastric ulcer." In 20 per cent of the cases in which operation was performed in which roentgenologists considered the lesions to be inoperable or of doubtful operability the lesions proved to be removable. Conversely, of the carcinomatous lesions which at operation proved to be removable, 11 per cent had been considered to be inoperable or of doubtful operability by the roentgenologists. Emphasis should be placed on the fact that these percentages pertain to the series of cases being considered in this study, namely the cases of cancer in which operation was performed, whereas in most of the cases in which the roentgenologist considered the lesion to be frankly inoperable surgical exploration was not done. In recent years because of this error of interpretation and the extent of the involvement of the stomach viewed roentgenologically the percentage of patients who have been subjected to exploration of the stomach has increased progressively, and interestingly enough the rate of resectability has likewise increased. Fifty-eight per cent of the patients on whom a diagnosis of a malignant lesion of the stomach was made at the clinic from 1907 to 1938, inclusive, were subjected to exploration. In 45 per cent of this group, which is 26 per cent of the original group, the lesion was removed.

CONCLUSIONS

The operation of partial gastrectomy affords an excellent means of treatment of cancer of the stomach with successful cures in a large percentage of cases in which there are localized lesions regardless of their degree of malignancy and in a smaller group of those in which metastasis has been demonstrated. After patients on whom resection has been performed have survived a five year period the survival rate closely approximates that of the general population of similar age groups (chart 3). The risk of this surgical procedure has been comparatively low, considering the fatal nature of the lesion unless it is removed. The mortality rate has decreased progressively in recent years as a result of the advances made in the preparation of patients before operation and the treatment of such postoperative complications as infection, both local and general, pneumonia, atelectasis and pulmonary embolism.

In cases in which there is persistent dyspepsia, no matter of what type, roentgenographic and, when necessary, supplementary gastroscopic examinations are accurate methods of determining the presence of an intragastric lesion. Medical treatment of an ulcer type of dyspepsia should not be instituted without a roentgenologic examination being made to determine the exact location and nature of the lesion.

9. In 1939 there were 4 cases of total gastrectomy and 2 of local excision.
10. In 1940 there were 8 cases of total gastrectomy with but one death.
11. Survival rate beyond five years approaches that of the normal population (chart 3).

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. BOYCE AND DRs. WALTERS,
GRAY AND PRIESTLEY

DR. GEORGE T. PACK, New York: We have heard the most optimistic note that has ever been sounded in the history of gastric cancer since Billroth performed the first successful gastrectomy in 1881. However, of every hundred patients with gastric cancer entering American hospitals today, 40 to 80 (average 50) are in an inoperable condition and are discarded without hope of salvage (first loss factor). Of the remaining 50 patients undergoing laparotomy, 25, or half, have resectable cancers, so that the other 25 are doomed as far as cure is concerned, although palliative gastrojejunostomy or gastrostomy may be done (second loss factor). Cure becomes possible therefore for only 25 of the original 100 patients. Now the resection mortality throughout America varies from 10 to 60 per cent (average 20 per cent), and if 5 of the residual 25 patients die of the operation only 20 of the original 100 patients survive (third loss factor). These 20 patients must live through the three, five and ten year follow-up periods to fulfil the definite criteria of cure. Unfortunately, two thirds of these survivors are dead by three years, three fourths by five years and four fifths by ten years (final loss factor). Dr. Livingston and I have assumed two points of view with regard to the curability of gastric cancer: a pessimistic point of view of the disease as a whole with only 3 to 6 per cent cures of the total patients seen and an optimistic outlook of 20 to 30 per cent five year survivals without recurrence for those patients with resectable gastric cancers. How can these figures for end results be improved? If gastric surgeons as capable as Drs. Walters, Gray and Priestley were in every American hospital, paradoxically enough it would not tremendously increase the number of gastric cancer cures, because the difference in resection mortality of 10 and 25 per cent means only 3 to 5 patients of the 100 originally seen. Operative skill increases the rate of resectability and lowers the resection mortality but is limited in its application to those 25 or 33 per cent of patients with technically resectable cancers. It is the medical attendant through his influence for or against surgical exploration who plays a role which may exceed in practical significance that of the skilled surgeon. Cancer of the stomach must not be considered a purely surgical responsibility or surgical disorder. It is the problem and the duty of the general practitioners throughout the United States to suspect cancer first in any patient over 40 years of age who complains of indigestion and not to subject him to conservative or medical treatment until they are certain that gastric cancer is not present.

DR. A. W. OUGHTERSON, New Haven, Conn.: Dr. Boyce has contrasted the results in the more specialized clinic with those in the general hospital. The first shows what can be done, and the second more closely approximates what is being done. A still more comprehensive picture of the problem of cancer of the stomach might be obtained by studying the results in the total community. We have done such a study in New Haven and an even more pessimistic picture is revealed. In our community only 58 per cent of the patients with cancer of the stomach ever enter a hospital. The disease is so far advanced that only 1 in 10 have a resection of the tumor. Only half of these survive the operation (three hospitals) and 2 per cent of the total group are five year cures. Thus our effectiveness in curing cancer of the stomach in the community is not greater than 2 per cent. However, there is a ray of hope, for of those patients surviving resection of the tumor 40 per cent are living five years. While 10 per cent of this total community group had resections, not more than half of these could be considered as curative operations. Put another way, more than 90 per cent of the problem of cancer of the stomach is in the hands of those who see the patients before they come to the surgeon. The first great problem is public education. The patient must come to the physician early in the course of the disease. These are problems for the Women's Field Army and other organizations

engaged in educational work. The second and equally difficult problem is early diagnosis for which the physician is responsible. There is a misconception still prevalent, and found in most of the textbooks, that cancer of the stomach can be diagnosed from signs and symptoms. It cannot be so diagnosed in the curative stage. It can only be suspected. Laboratory aids, such as x-ray and gastric analysis, are required. When, then, should these procedures be carried out? Since the treatment of cancer is an emergency, the duration of symptoms should receive more attention than is ordinarily given, and I believe that when the patient comes to see a physician, as soon as he determines that there is something wrong with the gastrointestinal tract (we see many patients in our clinic in whom we cannot even distinguish whether the tumor is primarily in the large bowel or the stomach), the next important question is How long has he had the symptoms? If he has had symptoms for one month, then immediately x-ray and gastric analysis and other laboratory procedures are indicated. Since 90 per cent of the cancer problem is related to late diagnosis and treatment, the greatest responsibility must rest on the physician who first sees the patient. He must be constantly cancer conscious.

DR. ROBERT ZOLLINGER, Boston: The speakers have called attention to the difficulties in early diagnosis of gastric carcinoma and to the relationship of gastric ulcer to carcinoma. We know that even if the patient is under 40 years of age, has high free acid values in his gastric secretion and apparently improves clinically and by roentgen examination, he may harbor a malignant lesion. If there is any suspicion of malignancy either clinically or roentgenographically after three weeks of medical treatment, surgery is advised. During the last ten years in the surgical service at the Peter Bent Brigham Hospital, we have had under observation 217 patients with carcinoma of the stomach. These patients represent a cross section of ward and private patients. In 69 patients the lesion was removed by subtotal resection. In a few this was a palliative procedure, because distant metastases were obvious at the time of operation. The mortality for subtotal resection was 23 per cent. I agree with Dr. Boyce that no attempt should be made to keep the operative mortality down by refusing exploration. During this ten year period we have operated on approximately 85 per cent of our patients with gastric carcinoma. Since the patient's only chance for survival lies in removal of the lesion, we believe that operation should never be refused unless there is clearcut evidence of distant metastasis. Our incidence of resection in the last five years has been approximately that of Dr. Walters', namely 45 per cent. This is an increase of 18 per cent over the previous five year period. In the period of 1931 to 1935, only 8 of the 107 patients with carcinoma of the stomach lived five years or longer. In relation to resection, this is a five year survival rate of 38 per cent. These patients cannot be classed as cured, however, because 2 died of recurrent carcinoma in the sixth year after operation. Our experience has been similar to that of Dr. Walters and his co-workers in that the presence of lymph node metastasis does not mean that the patient will not survive five years or longer. Three of our five year survivors had regional lymph node metastases. Likewise the individual under 40 years of age has a survival expectancy which compares favorably to the older age group. Two of our five year survivors were but 33 and 35 years of age respectively when resection was carried out. We must therefore continue to offer surgery to the patient with carcinoma of the stomach, because, as has been shown here this afternoon, results are not as discouraging as they sometimes appear to be.

DR. WALTER L. PALMER, Chicago: There is a small group of patients with gastric carcinoma who can never be saved because the lesions metastasize so early, the so-called rapidly metastasizing carcinomas of Jarco. Then there are individuals who show no symptoms until the tumor becomes quite large. However, even such large tumors may still be resectable. A greater difficulty than either of these two is the fact that people are so likely to disregard symptoms and so prone to pay no attention to what they term indigestion. We must carry on a

campaign of education to induce people to consult physicians whenever they have abdominal distress. We physicians, particularly internists and general practitioners, must learn that we cannot diagnose gastric carcinoma on the basis of symptoms or physical findings or laboratory findings. We must have routine x-ray examinations and frequent gastroscopic examinations. The difficulties with regard to x-ray examination are numerous. There is often the financial problem. We must find some way in which routine x-ray examination can be made available to people of all economic classes, and we doctors must learn to order x-ray examinations quite routinely. Then the roentgenologist must learn to do a better job than some roentgenologists do in the examination of the stomach. It is my judgment, based on various statistics, including Dr. Pack's, and certain personal observations, that the statistics offered by Dr. Boyce are more in accord with what is actually happening the country over in the treatment of gastric carcinoma today than are the statistics of Dr. Walters and his co-workers. I trust and I hope that the statistics offered by Dr. Walters will in another generation, if not sooner, be representative of medical and surgical practice throughout the country. To this end we physicians must do better, the patients must do better, the roentgenologists must do better and the general surgeon also must do better. I am sure that if the internists in many of the smaller cities had available such skilled surgical assistance as is available in the larger centers, they would send patients earlier to the surgeon, and a higher percentage of successful resections would be carried out.

DR. WALTMAN WALTERS, Rochester, Minn.: I have nothing to add except to emphasize what Dr. Palmer said at the last. Dr. Palmer has put the responsibility on the surgeon as the surgeon has put the responsibility on the internist and the roentgenologist. One of the difficulties encountered in the surgical treatment of chronic ulcer is due to the fact that in years past the mortality rate from the surgical removal of ulcer by some surgeons was such that medical men felt it was safer to take the chance that gastric ulcer might not be malignant and to carry patients on medically than to subject them to surgical operation until it was absolutely necessary. If, therefore, surgeons hope to secure greater cooperation from internists, they must be able to demonstrate to the internists that mortality rates from surgical intervention are not such as have been reported as occurring in the past in some of the charity hospitals. There is no reason why the patient in the charity hospital should not receive exactly the same benefit of expert surgical treatment as the patient in the private hospital. Last year, at a meeting of the Western Surgical Association, Dr. Eric Larson reported a study, carried out in one of our Western states, on resections performed for both benign and malignant lesions of the stomach, which revealed a mortality rate of from 40 to 50 per cent. He had brought these results to the attention of his confrères in the state, the surgeons particularly, with a plea that men who were interested in gastric carcinoma should unite in trying to formulate methods of cooperation with the medical services in better preparation of patients to be operated on and that performance of operations be restricted to surgeons of experience. He stated that after use of such methods and restriction, as a result of this campaign, the risk for resections of the stomach for lesions of similar types to those previously reported had decreased to 10 per cent. It rather disturbs me when I see reports from some of our friends abroad as to the high mortality rate of gastric resections for malignant lesions reported from the United States. It may be true that it is high where men do not have the opportunity to perform operations in sufficient number to improve technique; and what the answer to that problem is I do not know. However, I do know that at the present time the general mortality rate of resection of the stomach for malignant disease is far too high for surgeons to expect to receive from the internists the high degree of cooperation that will be necessary if there is to be opportunity to operate in cases of malignant gastric lesion in the early stages when the clinical history is not unlike that of benign ulceration.

PERMANENT COLLAPSE THERAPY IN PULMONARY TUBERCULOSIS

RICHARD H. OVERHOLT, M.D.

BOSTON

The number of patients who arrest pulmonary tuberculosis to rejoin their families and live reasonably normal lives is steadily increasing. A large proportion who started treatment when the disease was already in an advanced stage have been salvaged through the aid of pulmonary collapse, effected by a reconstruction of the thoracic wall. This means that there is a significant and growing thoracoplasty population who will require close medical surveillance for the rest of their lives. Since this fragment of the population is not immune to other diseases, any doctor may be called on for advice. It is therefore desirable that all members of the profession be familiar with the changes in the thorax which are brought about by thoracoplasty. Roentgenologists are particularly concerned with the problems of these patients.

Great reliance is placed on fluoroscopy and serial roentgenograms in following the progress of the arrested disease. It is essential that roentgenologists appreciate the manner in which the position of the lung and chest wall has been altered by surgery if interpretation is to be accurate.

INDICATIONS FOR PERMANENT THORACIC WALL READJUSTMENT

Modern thoracoplasty has attained with just cause a preeminent position in the management of advanced pulmonary tuberculosis. By advanced disease it is implied that destruction of portions of the lung with cavity formation has taken place. The elasticity and functional capacity of adjacent segments of the lung are frequently reduced by fibrous tissue change. Both cavitation and productive change signify previous damage to pulmonary substance which, from a functional point of view, is irreparable. In advanced disease with cavitation, the volume of the healthy lung is so reduced by disease that it is incapable of filling the thoracic space, which is maintained to a certain minimum volume by an unyielding bony cage.

How may healing take place under such conditions? Pulmonary cavities must be closed and remain closed. Fibrous tissue must not tear under the strain of ordinary thoracic movement, to insure against reactivation or hemorrhage. The scar must be solid, but at the same time its contraction should not pull thoracic viscera out of position to the extent that cardiorespiratory function is impaired. Certain patients are fortunate enough to make these adjustments spontaneously, arrest the process and enjoy moderate activity without reactivation. For a second group the problem has been solved by an adequate pneumothorax (or another temporary measure) which is maintained indefinitely with safety. There is a third group to which thoracoplasty is not applicable. Patients who have such extensive disease which is so distributed to make it technically

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The medical staffs of the Norfolk, Essex, Bristol and Barnstable County sanatoriums in Massachusetts, the Rhode Island State Sanatorium, the New Hampshire State Sanatorium and the Vermont State Sanatorium and other consulting physicians helped in assembling data for this report.

impossible to bring all disease under control by any single method or combination of methods must be excluded from this discussion.

A significant proportion of the tuberculous sick will not fall in the foregoing categories. The health of patients in this fourth group can be restored with surgical help. They are those patients who suffer from advanced disease with irreparable pulmonary damage. A discrepancy exists between the volume of healthy lung and the volume of the thorax (figs. 1 to 6). Temporary measures have failed or present no reasonable chance of being effective.¹ They have an equivalent of two healthy pulmonary lobes, the two on one side or one on each side (fig. 6). Preferably, the disease is stable. The thoracic cage can be refashioned and the diseased

3. Limitation of motion is imposed on the diseased lung.
4. The collapse of the disease can be made highly selective with conservation of healthy portions of the lung (figs. 2, 3, 5 and 6).
5. Disturbances due to distortion of the thoracic viscera, such as upward displacement of the lower lobe and lateral displacement of the heart and great vessels, are corrected

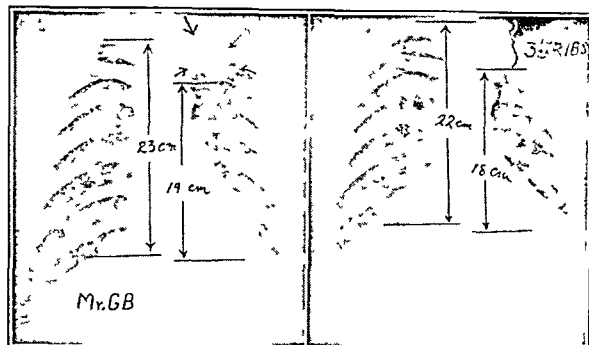


Fig 2.—Appearance of chest before operation and four years after operation illustrating reduced volume of the left lung and appearance after the volume of the left thoracic cage had been reduced correspondingly. Note that the vertical diameter of the remaining healthy lung is essentially the same before and after treatment. Note dense bony shell in area treated and that the apex remains at the level of the third thoracic vertebra. G B, a man aged 27. The duration of the disease was nine years. He entered the Norfolk County Hospital in September 1927 but left against advice in May 1928. He was readmitted in June 1936. A single stage thoracoplasty with mobilization was performed in July 1936. He was discharged with the disease in an apparently arrested condition in February 1937. He has been well and working for four years.

All of these readjustments are common accomplishments of a free pleura pneumothorax and thoracoplasty. In addition to these considerations, there are added benefits which are unique for thoracoplasty:

6. Thoracoplasty adjusts the thoracic volume so that it comes to equal the volume of the healthy lung. In other words, the functionless portion of lung is placed under permanent control.

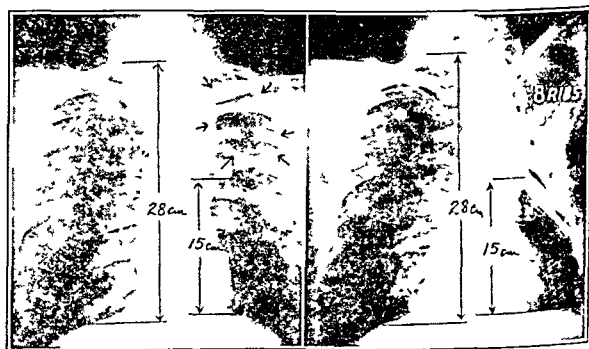


Fig 3.—Preoperative (1933) and postoperative (1941) appearance showing extensive area of pulmonary destruction and reduction in vertical diameter of remaining healthy lung. The right lung measures 28 cm and the left lung 15 cm. A permanent alteration of the thoracic wall permitted the cavity to close and conserved the lower lobe. The vertical diameter of the left lung remains at 15 cm. Note solid and unyielding newly formed thoracic wall. There has been no tendency for reelevation of the apex after seven years. W P, a man aged 41. He was admitted to the Norfolk County Hospital in June 1933. A three stage posterior thoracoplasty was performed in February 1934. This operation antedated the use of supplementary lung mobilization. A posterior revision and complete mobilization of the upper lobe was done in November 1935. The patient was discharged in June 1937. His general condition has remained satisfactory and the lesion was considered to be arrested when he was last examined in February 1941.

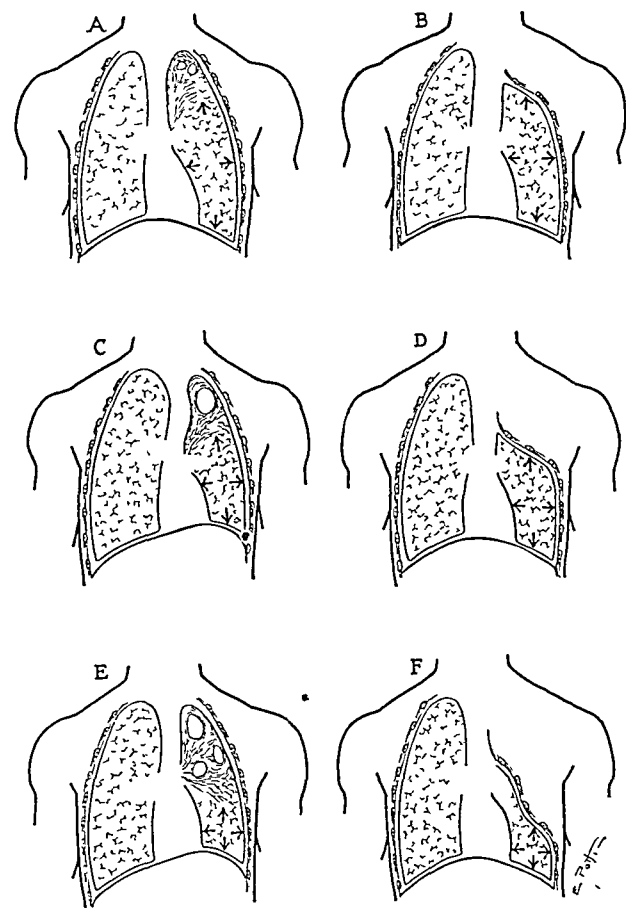


Fig 1.—Diagrams which illustrate necessity for permanent readjustment of thoracic wall in advanced pulmonary tuberculosis. Varying degrees of unilateral involvement are shown in drawings A, C and E. The discrepancy which exists between the volume of the remaining healthy lung and the volume of the hemithorax is indicated. In drawings B, D and F the chest wall is shown in its new location. Note that the thoracic cage in each instance has been refashioned to conserve uninvolved lung, yet to splint the damaged lung adequately and permanently.

lung released from its anchorages. The permanently altered position of the chest wall will provide a permanent collapse.

Modern thoracoplasty will accomplish the following:

1. Fibrous tissue is released, permitting cavity closure.
2. Pulmonary tissue which has been partially damaged but not totally destroyed, whose elasticity has been impaired by fibrosis, is relaxed.

1. In addition to procedures such as infective pneumothorax or phrenic nerve surgery, which may precede consideration for thoracoplasty, another supplementary surgical aid should be mentioned. Certain patients with giant cavity and evidences of a "check valve" communicating bronchus may be prepared for thoracoplasty by preliminary closed (Monaldi) or by open cavernostomy.

7. The risk of tuberculous or mixed empyema developing in an artificially maintained air space is eliminated (fig. 5).
8. The risk of spontaneous pneumothorax on the side of treatment is greatly lessened.

PERMANENCE OF RESULTS SUGGEST SUPERIORITY
OF PERMANENT COLLAPSE THERAPY

From the long range point of view, one is justified in calling attention to the fact that a permanent thoracic wall readjustment may in the future come to be looked on as one of the most conservative types of treatment. Final conclusions as to the ultimate fate of patients treated by thoracoplasty must be deferred until more time has elapsed. However, in order to obtain some idea as to how well such patients are holding up, a preliminary survey has been made. The study was limited to patients treated successfully by thoracoplasty who completed the recommended postoperative regimen

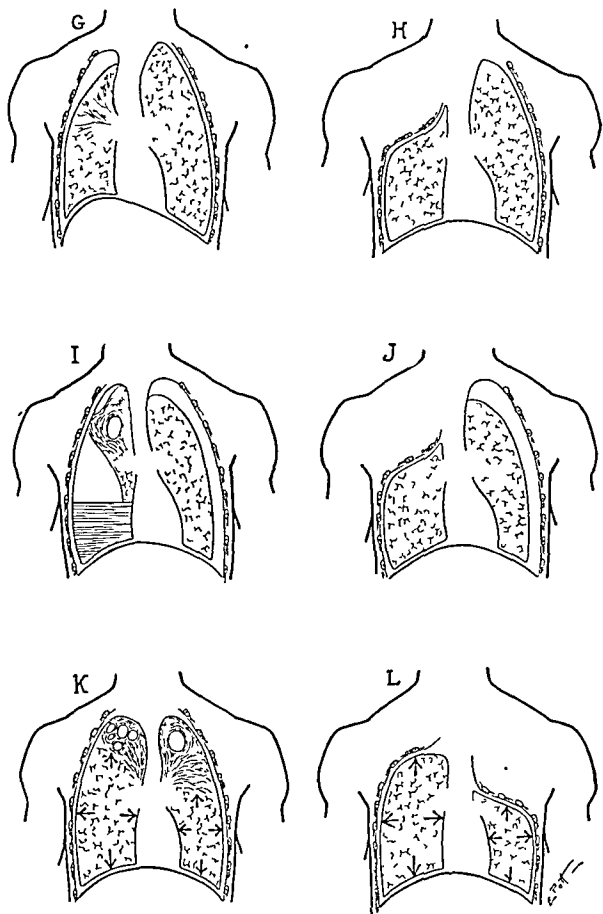


Fig 4—Diagrams which illustrate the necessity for permanent readjustment of the thoracic wall in advanced pulmonary tuberculosis. In drawing G is shown a contracted right lung, the upper lobe of which was the previous site of active disease. A temporary form of collapse (pneumothorax) aided in bringing the process under control. Owing to difficulties in the safe maintenance of the pneumothorax, a conversion type of thoracoplasty was done. In drawing H is shown the manner in which the chest wall was refashioned to control the upper lobe permanently, yet at the same time not to interfere with function of the lower lobe. Note that the diaphragm has returned to its normal position. From a functional standpoint the patient is better able to use the right lower lobe under conditions as shown in H than in G. In drawing I a bilateral pneumothorax case is illustrated. On the right side, the pneumothorax is contralateral and is complicated with fluid or empyema. The left lung is under adequate control by an uncomplicated or free pleura pneumothorax. A specific collapse of the upper lobe with salvage of the lower lobe is shown in drawing J. Note that this is conservative treatment, as the patient has more healthy lung available for use than was the case under situation I. In drawing K a far advanced bilateral case is illustrated. Note the diminished volume of remaining healthy lung on both sides. The pleura is adherent, so pneumothorax on either side is impossible. Phrenic nerve surgery is contraindicated because of the extent of the apical process and the necessity for conservation of all available lung function. In drawing L is shown the refashioned thoracic cage which provides permanence of control of upper lobe disease yet conserves healthy basal portions of lung.

and were discharged with the consent of their medical advisers. Data were obtained from the follow-up departments of various referring sanatoriums and from refer-

ring physicians. The great majority of the patients had been in for a check-up examination within the past six months. No data on 1 patient can be obtained, and this patient has been counted as having died of tuberculosis. The results of this study are given in table 1.

Almost any salvage rate in this group of tuberculous patients can be considered on the credit side. At one

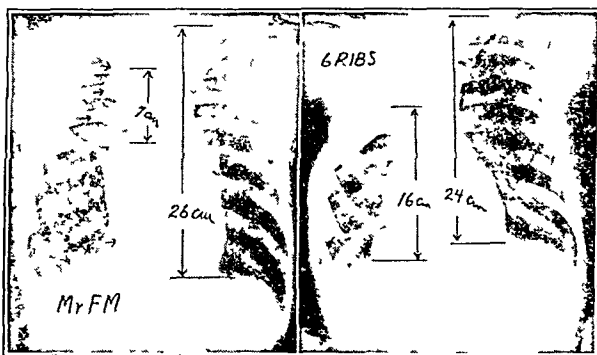


Fig 5—Preoperative (1938) and postoperative (1941) appearance showing contralateral pneumothorax which was abandoned in favor of a selective permanent collapse. Note that the right lower lobe has been salvaged. A bronchiogenic process in the left lung healed. Note regeneration of osseous tissue in the upper lobe area thus permanently controlling disease. F M, a man aged 29. He was admitted to the Rhode Island State Sanatorium in December 1938. A two stage posterior thoracoplasty with mobilization and subtotal scapulectomy was performed in September and October 1939. The patient was last examined in February 1941. His general condition was excellent, and the process was considered to be apparently arrested.

time they all suffered from advanced disease. The majority were referred for thoracoplasty as the only alternative. It is fair to assume that the severity and extent of the process from which they suffered were more threatening than those of the average patient undergoing sanatorium treatment. Yet this group seems to be faring better than the average patient who takes sanatorium treatment, arrests the process and is discharged with consent. Foster² has recently reported a

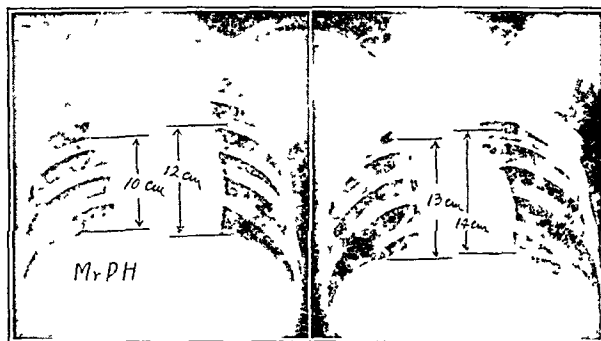


Fig 6—Preoperative (1937) and postoperative (1940) appearance of extensive bilateral involvement showing considerable reduction of vertical diameter of residual healthy lung. Note the character of the selective and permanent collapse provided. There is no distortion of thoracic viscera. The lower lobes are better able to function with release of upward traction exerted by diseased lobes above. Note the solid appearance of the reformed chest wall in area treated. Both scapulae have been reduced in size to permit them to fit in the depression in newly shaped wall without impingement or elevation of shoulder girdle. P. H., a man aged 28. Admitted to Norfolk County Hospital in February 1937. A two stage left posterior thoracoplasty with mobilization and subtotal scapulectomy was performed in June and September 1937. The same procedure was carried out on the right side in August and October 1937. The patient has been working steadily since 1939. The date of the last follow up was March 21, 1941.

study of 6,906 patients discharged alive from various sanatoriums in this country. Seventy per cent left the various sanatoriums with consent. It was found that of

² Foster, Terry C. Rehabilitation and After Care of the Tuberculous, *Am Rev Tuberc.* 43: 274-284 (Feb) 1941.

this group but 60 per cent were living after a period of five years. The group that was discharged with consent was not classified as to the stage of the disease on admission. The 60 per cent final salvage figure would be a trifle lower still if minimal cases had not

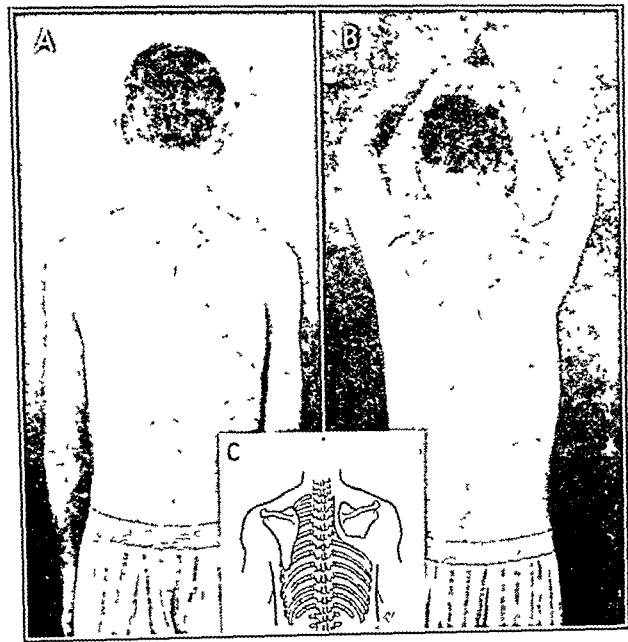


Fig. 7—Appearance of patient who had an upper selective (six rib) thoracoplasty and partial scapulectomy. The inset shows the relation of the treated scapula to the newly shaped thoracic cage. Note evenness of shoulder girdle and full range of motion. J. D., a man aged 40. Norfolk County Hospital. Traveling as a salesman for past two years.

been included. Exactly comparable end result studies are impossible to find. It is significant, however, that 94.4 per cent of the thoracoplasty patients included in the five year study were found to be living—a figure greatly higher than that given by Foster for all types of patients leaving with consent, and even higher than the survival rate of patients entering with minimal disease.

TABLE 1.—Survey Showing Permanence of Results

	Patients Discharged 5 Years or More		Patients Discharged Under 5 Years		Total	
	No.	%	No.	%	No.	%
Number of patients.....	107	100	315	100	422	100
Living.....	101	94.4	305	97.8	406	96.9
Reactivated *.....	4	3.7	18	5.7	22	5.2
Died—Of tuberculosis.....	3	2.8	1	0.3	4	0.9
Of other causes.....	3	2.8	6	1.9	9	2.2

* Includes those who died of tuberculosis.

Roberts³ has called attention to the increased chances for lasting results from permanent collapse by citing statistics from the Brompton Hospital Reports for 1936. He said "It is shown that the chance of surviving five years in B3 cases treated without collapse was 23.7 per cent; with pneumothorax, 55.3 per cent; and with thoracoplasty, 66.6 per cent. Thus, the expectation of living five years is approximately three times as great in cases submitted to thoracoplasty as in the average B3 case."

3 Roberts, J. E. H.: The Place of Surgery in the Treatment of Pulmonary Tuberculosis, J. Roy. Inst. Pub. Health & Hsg, London 1: 857-863 (Nov.) 1938.

PERMANENT COLLAPSE FROM THE STANDPOINT OF THE PATIENT

The permanent collapse provided by thoracic wall readjustment appears to give the advanced patient better protection against reactivation and a better chance for a lasting result under conditions of moderate activity. The great majority of post-thoracoplasty patients are able to work. A questionnaire was sent out to patients

TABLE 2.—Replies to Questions^{*}

	Answers Given in Percentages	
	Yes	No
1 Do you consider yourself well?	91	9
2 Are you able to work?.....	83	17
3 Do you place restriction on your physical activity?		17
Yes.....	25	
Yes.....slight	49	
Yes.....moderate	9	
Yes.....marked		15
4. Are you short of breath?.....		
Yes..after slight exertion	49	
Yes..after moderate exertion	50	
5 Do you have limitation of arm or shoulder motion?		70
Yes...of slight degree	18	
Yes...of moderate degree	11	
Yes...of marked degree	1	
6 Do you consider yourself deformed?.....	18	82
7. Are you glad you had a thoracoplasty?.....	99	1

* Replies received from 293 patients.

treated by thoracoplasty who had been discharged from the sanatorium with consent. Answers were received from 293. It was found that 83 per cent of all the patients had been working an average of twenty-three months. The questionnaire also made inquiry as to the patient's own reaction to the benefits of the operation, as to possible ill effects from the altered position of the chest wall, and restriction in physical activity.

In table 2 is a summary of the replies from questionnaires sent to patients who had successfully gone



Fig. 8—Lack of deformity in three post thoracoplasty patients. A two stage (six rib), a four stage (eight rib) and a two stage (five rib) operation was performed respectively. The respective ages were 33, 50 and 65 years at the time the thoracic wall reconstruction was carried out.

through thoracoplasty and who left the sanatorium with the consent of the staff.

The following data were also obtained and the averages for the group are as follows:

A. Average period of time patients have been working, twenty-three months.

B. Interval between first diagnosis and operation, thirty months.

C. Duration of preoperative sanatorium treatment, twenty-five months.

D. Duration of postoperative sanatorium treatment, nine months

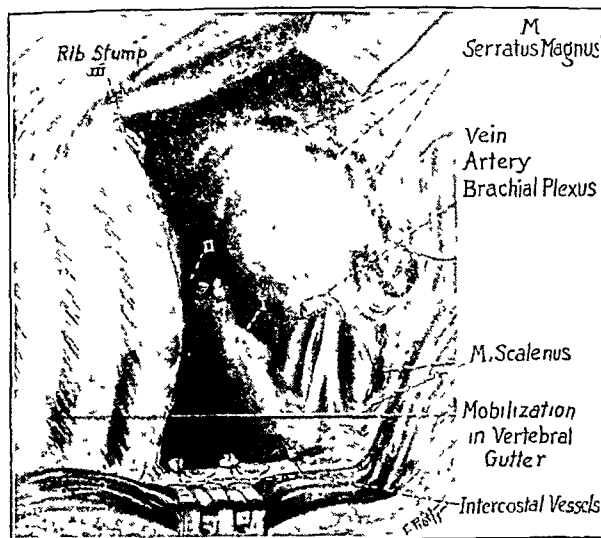


Fig 9—Operative field of first stage thoracoplasty with specific lung mobilization in vertebral gutter. Note that the apex of the lung has been completely separated from its attachments. The vertical diameter of the hemithorax has been reduced, as the apex of the lung now lies opposite the fourth thoracic vertebra. The mobilization has been continued down beneath the unresected third and fourth ribs posteriorly. This gives greater assurance of cavity closure and immediate sputum conversion. The medial portion of the periosteum is carefully preserved and left attached to the extrapleural fascia. This layer and periosteum are carried down with the lung to form an unyielding new chest wall.

Letters from patients accompanied many answers to the questionnaires to emphasize how overjoyed they were with their physical condition. Repeatedly the patients stated that the scar and changes in contour of the chest, even discomforts or obvious deformity if present, constituted a small price to pay for restoration of health (figs. 7 and 8). Many stated that their only regret was that the operation had not been performed sooner.

As modern thoracoplasty is being appraised in terms of permanence of results, there is a greater willingness on the part of the patients and phthisiologists to consider its use at a much earlier stage. It is now recognized not only that each collapse procedure must be evaluated as to likelihood of effecting an immediate cavity closure but that consideration must be given to conservation of healthy lung and permanence of results. Alexander⁴ stated four years ago "In last analysis, a thoracoplasty is used to close a pulmonary cavity that no other operation can close." To the last phrase might be added the words "as selectively, as permanently, and keep closed as securely." Many patients who have been temporarily helped by a pneumothorax which is complicated by indivisible adhesions may have their chances for lasting good health greatly enhanced by a conversion of the collapse to the permanent form that thoracoplasty provides. The phthisiologist should anticipate difficulties that may be encountered with prolonged pneumothorax maintenance. Too often the thoracic surgeon is asked not only to treat the pulmonary lesion but also serious complications of pneumothorax in the same patient simultaneously. There is an optimal time

when a temporary form of collapse can best be converted to a permanent form. This time antedates reactivation, reexpansion of a cavity, contralateral spread or the development of a complicating empyema.

REFINEMENTS OF MODERN THORACOPLASTY

Several refinements of the modern thoracoplasty have contributed to its successful application in tuberculosis therapy. The development of the operation as it is performed today represents one of the most interesting chapters in surgical history. The reader may refer to an excellent historical summary by Alexander.⁴ The need for removing the unyielding bony thorax over the diseased lung was recognized by all the earlier writers, including de Cernville, who performed the first thoracoplasty in 1885. From then on, the extent and sequence of rib removal was the principal concern. The extensive resections of the upper ribs as first practiced by Brauer and Friedrich soon lost favor. The paravertebral resection of shorter segments of all the ribs except the eleventh and twelfth advocated by Wilms and Sauerbruch became for many years the standard operation. The resections proceeded from below upward, and total collapse was the goal. The next great step came with methods to divide the operation into stages, thus materially reducing operative shock. The below-up sequence was then reversed. This was the beginning of an effort to conserve as much uninvolved healthy lung as possible. Up to this point the surgeon concentrated solely on decostalization of the thoracic cage. Semb⁵ went beyond just a simple treatment of the ribs and advocated liberating the attachments of the fascia which envelops the apex of the lung. It was pointed out that if the apex was permitted to contract toward the hilus a more selective collapse could be attained by thoracoplasty. I⁶ described a modification of the supplementary apicolysis of Semb together with an adaptation of the principle for a delayed second or multiple stage procedure. The separation of the lung is carried out in much the same way as recommended by Semb. After one has divided the supporting structure (the intercostal vessels, nerves, periosteum, Sebileau's bands and adhesions to the prevertebral fascia), the medial aspect of the apex is wiped down inside the extrapleural fascia leaving this layer undisturbed on the mediastinum.

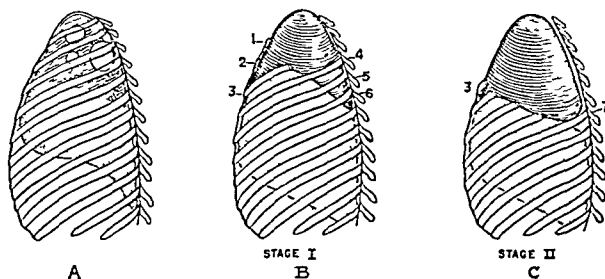


Fig 10—Diagram of lateral aspect of the thoracic cage to indicate: A, extent of disease; B, extent of decostalization and mobilization of lung carried out at first stage. Note that the lung has been separated beneath unresected ribs posteriorly in order to liberate attachments over diseased area. C, complete two stage posterior thoracoplasty with mobilization of the lung. Regenerated osseous tissue in area under treatment is not shown. The upper lobe is contracted, thus elevating the lower lobe and diaphragm as indicated in A. Note that in B and C the diaphragm is in normal position. Also note that the volume of healthy lung remains the same in all three situations.

Superiorly and along the paravertebral line the fascia is divided, thus permitting it to remain attached to the

⁴ Alexander, John: The Collapse Therapy of Pulmonary Tuberculosis, Springfield, Ill., and Baltimore, Charles C Thomas, 1937, pp 23-33 and p 417.

⁵ Semb, C. Thoracoplasty with Extrafacial Apicolysis, Acta chir. Scandnav (supp 37 art 21 76: 1-85, 1935).

⁶ Overholt, Richard H.: Thoracoplasty with Lung Mobilization, Am. Rev. Tuberc. 35: 411-442 (April) 1937.

lateral surface of the lung. Emphasis has been placed on the advisability of carrying periosteal elements and fascia down with the lung over its lateral surface. The reconstructed chest wall should eventually be firm and unyielding. The apex must be held down in its new position. The healed lung must be protected throughout life from stresses and strains due to ordinary physical activity.

Other refinements have added to the success of the operation. Actual palpation of the lung at operation guides the surgeon in designing the best procedure for the individual case. The relationship of the involved area to anchoring structures can be determined. These anchorages can be liberated by specific mobilization at their peripheral attachments. More than three fourths of the upper lobe lesions have been found to be in the posterior third of the lobe. The pleura and extrapleural fascia in this region are usually found to be fixed and adherent not only to the ribs from their posterior angles medially but frequently to the vertebral bodies as well. If the lung is adherent to the chest wall below the area of rib resection, the lung is separated two or three segments below by tunneling downward outside the fascia in the vertebral gutter (fig. 9). This specific mobilization increases the likelihood of immediate cavity closure and sputum conversion after the first stage. I⁷ previously reported that 38 per cent of cases so treated showed an immediate conversion of sputum which was maintained for longer than an eight week period. The patient then approaches the second stage in a better condition and with far less danger of bronchiogenic spread of the disease. If a second stage is necessary, additional ribs are resected and the apicolytic pocket is opened. If further liberation of the lung in the vertebral gutter is needed, the previously formed space in the vertebral gutter beneath facilitates such a step (fig. 10). My associates and I believe that supplementary lung mobilization has helped us to provide a more highly selective and conservative type of thoracic wall readjustment. Among the completed group, a single stage so far has been sufficient for 164 patients.

Improvements in structural alterations have not been confined to the treatment of the ribs and lung. Following partial thoracoplasty, patients may suffer deformity,

been followed. A partial scapulectomy is performed. This is more conservative than carrying the collapse down over the healthy lung in order that the shelf may be eliminated. This has also improved on the post-operative appearance as it has eliminated the cocked-up shoulder (figs. 7 and 8). Uneven shoulders increase the list of the head to the operated side, and this in turn tends to increase cervical and thoracic scoliosis.

Not only has the general plan of the operation been greatly improved, but it is also being executed with greater safety. Operative mortality rates are constantly

TABLE 4.—*Supplementary Procedures*

	Number	Per Cent
A. Patients operated on since lung mobilization became routine	614	
Patients whose lung was mobilized.....	491	80%
B. Patients operated on since subtotal scapulectomy became routine in partial thoracoplasty..	323	
Patients whose scapula was resected.....	194	60%

being lowered. This has taken place irrespective of the fact that today surgery is being used more and more in an attempt to check progressive disease and treat patients with bilateral cavitation. For example, in the years 1932 to 1936 inclusive the operative mortality in our hands was 6 per cent, whereas in the past four years it has dropped to 4.8 per cent. During the latter period there have been 27 operative deaths among 557 patients. Only 3 of the 27 were classified preoperatively as good subjects with chronic disease in which the involvement was essentially unilateral. Twenty-four, or 90 per cent, of all those who died had active bilateral disease, empyema or some serious extrapulmonary complication. General data concerning the risk of operation and the extent of the procedures carried out in 874 patients between April 1, 1932 and April 1, 1941 are given in table 3.

The data given in table 4 are of interest with regard to the frequency that supplementary procedures have been employed.

CONCLUSIONS

1. In uncontrolled advanced pulmonary tuberculosis, the loss of lung substance creates a discrepancy between the volume of the remaining healthy lung and the volume of the thoracic cavity.

2. When spontaneous adjustments of thoracic viscera have not or obviously cannot bring about healing, collapse therapy is indicated.

3. When temporary measures fail or cannot indefinitely be maintained with safety, a permanent readjustment of the thoracic wall should be considered.

4. The modern thoracoplasty provides unique benefits:

(a) The thoracic volume is adjusted to equal the volume of the remaining healthy lung, thus placing functionless lung under permanent control.

(b) The procedure may be highly selective for disease and conservative of uninvolved lung. The procedure is applicable in bilateral involvement if there is an equivalent of two healthy lobes.

(c) The risk of tuberculous or mixed empyema is eliminated and the danger of spontaneous pneumothorax on the side of treatment is greatly lessened.

5. Refinements of the modern thoracoplasty that have materially added to its effectiveness include lung palpation at operation, specific mobilization and the liberation of anchoring structures over areas of disease.

TABLE 3.—*Risk of Operation and Extent of Procedure*

	Number	Percentage		
		Operative Deaths	Patient Mortality	Stage Mortality
Patients.....	874	47	5.3	...
Stages.....	1,898	47	...	2.4
Bilateral thoracoplasty.....	25	1	4	...
Average number of stages.....	2.25			
Average number of ribs.....	5.83			
One stage apparently sufficient in....	164	(18.6%)		

limitation of shoulder motion and pain unless the scapula is properly fitted to the contour of the new chest wall. The uppermost unresected rib forms a shelf on which the tip of the scapula may impinge. If it rides above the shelf, the shoulder becomes elevated and deformity is increased. If the tip of the scapula overrides the unresected ribs, a painful shoulder may result. To correct a misfitting scapula after thoracoplasty, the recommendation of Holman⁸ and of Overholt and Tubbs⁹ has

7. Overholt, Richard H.: Extrapleural Pneumothorax, Dis. of Chest 7: 80-85 (March) 1941.

8. Holman, Emil: Partial Resection of the Lower Scapula as an Aid in Compressing Apical Tuberculosis, Abscesses, and in Conserving Vital Capacity, J. Thoracic Surg. 6: 496-501 (June) 1937.

9. Overholt, Richard H., and Tubbs, Oswald S.: Partial Scapulectomy in Selective Upper Thoracoplasty, Tubercle 20: 261-265 (March) 1939.

preservation of periosteal elements and subtotal scapulectomy to minimize deformity in partial thoracoplasty.

6. Five years or more later 94 per cent of the patients were alive and the disease was arrested.

7. The incidence of rehabilitation in the entire group of discharged cases was high. Ninety-one per cent considered themselves well and 83 per cent were working.

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ABSTRACT OF DISCUSSION

DR. EDWARD J. O'BRIEN, Detroit: I am thoroughly in accord with Dr. Overholt. Too many temporary procedures have been attempted in the past few years in an effort to supplant thoracoplasty. Paraffin packs, extrapleural pneumothorax and Monaldi operations have been popular. However, the use of thoracoplasty has more than doubled during this period. A few years ago this operation was done on 4 or 5 per cent of patients, and now it is performed on more than 20 per cent. In cases of minimal or moderately advanced disease, however, phrenic nerve interruptions frequently are sufficient for control. In one hospital, 21 per cent of patients had phrenic nerve operations only. The disease of a much larger percentage was arrested with artificial pneumothorax or with a combination of both phrenic nerve operations and pneumothorax. Dr. Overholt has stressed the desirability of selective collapse with thoracoplasty, and, while it is agreed that this should be done as much as possible, I do not believe it can be accomplished as accurately as he has suggested. The amount of collapse necessary will be in direct proportion to the extent of the disease. One should, however, attempt to salvage all the good portion of the lung possible. Dr. Overholt said that advanced disease exists when a cavity is present. A small cavity does not, in my opinion, suggest advanced disease. He stated that 160 of his patients needed only one stage of thoracoplasty. Surely these were not patients with advanced disease. In most clinics, apicolysis is not considered as essential as the author suggests. He stated that he uses it in about 80 per cent of his thoracoplasties. My associates and I use it in less than 5 per cent. He stated that, when the apex is freed, a noticeable contraction toward the hilus occurs. This also happens to a lesser degree with a complete, first stage thoracoplasty, which is not as hazardous as apicolysis and often more efficient. It has been our experience that after apicolysis more ribs had to be removed to cause closure of cavities than had to be removed without it. I believe, also, that the performance of a scapulectomy in 60 per cent of patients is altogether too high; in our experience the percentage is less than 5. While I am optimistic about thoracoplasty, I do not believe that 90 per cent of the patients will be able to do hard work. They might hold a desk job or something of the sort, but in most instances their activities should be restricted. The author stated that fluoroscopy is important in the follow-up study of these patients; in our experience it has been almost worthless. The diagnosis of a remnant of a cavity, after surgical collapse, is a difficult problem. Stereoroentgenograms and roentgenograms made with the Bucky diaphragm in many positions are often necessary, and occasionally a planigram is required.

DR. RICHARD H. OVERHOLT, Boston: The discussion by Dr. O'Brien has brought out many important points that should be emphasized. I particularly welcomed his mentioning that other types of procedures do effect cure in many patients. It was beyond my assignment to cover all methods. The technic of remodeling the thoracic wall is a surgeon's problem and something that thoracic surgeons should settle. Each one has to develop the particular method and technic which will give the best results. The goal is the same, that is to provide adequate control of the diseased lung, to conserve as much of the healthy lung as possible and to end up with a living patient who suffers no deformity or in whom the deformity is negligible. It was my purpose to indicate a method of readjustment of the thoracic wall that my associates and I have found works best for us. This presentation had as its real purpose the best solution for the patient who has advanced disease with pulmonary cavitation.

An appraisal of each patient in regard to the best collapse procedure from the standpoint of permanency should be made. Each collapse procedure must be evaluated in respect not only to the immediate possibilities of closure of the cavity but to what will be the lasting effect on closure of the cavity and on good health. It should be emphasized again that with the wall of the chest moved in permanently to a new location the patient is free from such complications as empyema and spontaneous pneumothorax. Too often the thoracic surgeon is asked not only to deal with a diseased lung but to treat serious complications in the pleura and in the wall of the chest at the same time. By that I mean complications of treatment with pneumothorax, such as tuberculous pleurisy, bronchopleural fistula and tuberculosis of the wall of the chest. There must be an optimum time for any form of treatment. Many unsatisfactory or uncertain forms of temporary collapse should be converted into permanent collapse. The optimum time to effect a conversion antedates the appearance of any of the complications of pneumothorax. When tuberculous disease has permanently destroyed certain portions of the lung it is necessary to devise a method of bringing that disease under control permanently.

PREMARITAL CONSULTATION

ROBERT LATOU DICKINSON, M.D.

NEW YORK

Examination for fitness is becoming the rule for all occupations save for the two that are most vital and most difficult—marriage and parenthood.

On an occasion when health weds sense in the hope of happiness, the best man may well be medicine. In marital adjustment, as in other fields, the curative function will some day yield first place to the preventive function. Our impatience and discontent steadily increase over any restriction to mere diagnosis of incurable ailment. If this holds for disease, why not for divorce?

It took twenty years in practice for me to come to the belief that marital maladjustments were mostly preventable; then as many more to earn enough to retire to devote a last twenty to a closer study of marriage counseling and its relation to general sex education and to character training. Be it noted that the facing of facts anent sex behavior in the light of statistical data is very recent. Publication of analysis of any considerable collection of elaborated histories dates back less than two decades,¹ the first medical analysis of this kind less than one decade,² while correlation of physical findings with family and individual record and personality study shows only four examples,³ the last two incomplete.

It is little wonder, therefore, that few physicians feel themselves equipped to undertake marriage counseling or find it feasible to spare the hours sometimes required to disentangle inhibitions and complexes.

A practical approach to procedure considers a minimal consultation and compares it with a relatively complete one. The first gets quick answers to simpler

From the National Committee on Maternal Health, Inc.

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The production of the teaching models was aided by the National Committee on Maternal Health, Maternity Center Association, Chicago, Field Museum and New York Academy of Medicine.

1. Davis, Katharine, B.: *A Study of the Sex Life of the Normal Married Woman*, J. Soc. Hyg. 8: 173, 1922; 9: 1 and 129, 1923; *Sex Life of 2,200 American Women*, New York, Harper & Brothers, 1929.

2. Dickinson, R. L.: *A Thousand Marriages*, Baltimore, Williams & Wilkins Company, 1931.

3. Henry, G. W.: *Sex Variants*, New York, Paul B. Hoeber, Inc., 1941. Strakosch, F. M.: *Factors in the Sex Life of Seven Hundred Psychopathic Women*, Utica, N. Y., State Hospitals Press, 1934. Landis, Carney, and others: *Sex in Development*, New York, Paul B. Hoeber, Inc., 1940. Dickinson.²

situations, such as diagnosis of pregnancy, the latter delves into complicated problems, perhaps of long standing. The three dimensional evidence includes, first, any heredity that really counts; second, adaptability and training, and, third, adjustability on coital

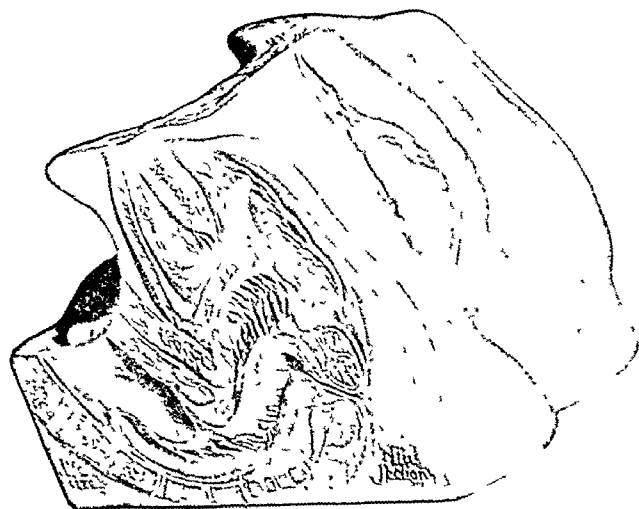


Fig. 1.—Model of the pelvic organs viewed diagonally from the front and from the side. Midsection is in relief on the side.

and reproductive planes. Incidentally it should be clear that the physical looking over is a step which, placed as early in the visit as confidence and good will are won, often noticeably shortcircuits the questioning and the listening.

What is the best time for the consultation?

Common sense—or uncommon sense—would call for conference on general fitness—or concerning any serious doubts—before the formal announcement of the engagement, and for full physical examination of both candidates before the date for the wedding is fixed. Furthermore, if it is true that, owing to the various depressions in finance that have greatly prolonged engagements, there is considerable increase in the number of companionate couples who adopt full marital privileges, then counseling belongs early, in order to antedate the possibility of complete intimacy. When keeping company was a brother-sister relation, the medical visit could be placed near what a secretary of mine, by a slip of the typekeys, called the “welding,” say ten days.

The status of the premarital consultation is on its way to repeat the history of the periodic health examination. That idea was sold to the public. Then the family doctor was asked to examine. If the visitor reported no pains or nerves or complaints, he was laughed out of the office. So the family doctor who is asked to do more than to fulfil the legal requirement of a blood test before marriage is prone to tell the young people to “leave all that to nature.” Too old, he does not sense that among present day youth “the frankness is amazing, the ignorance appalling.” Too young, he dare not be thought to show too detailed an interest lest he be thought saturated in sex. Unmarried, the medical man is supposed by our convention to be blankminded on sex technics and the medical woman to be sexless unless married. One might declare neither to be logically and clinically qualified for counsel unless he or she has been both happily married and unhappily married.

Which brings us to the query as to who really is the person best adapted to be a marriage counselor. More

important than any other qualification is personality. A college president was asked “Why do your students go in such numbers to Professor A with these problems?” and his answer was “They say he’s easy to talk to and he doesn’t tell.” By and large, the woman has the sympathy, the man the authority. As to specialist training, the New York City marriage counselor with the largest organized service in this country, at Mount Sinai Hospital, is a group in himself, with years each in psychiatry, urology and gynecology. Perhaps the psychiatrist can more easily revive his knowledge of pelvic diagnosis by a short refresher course than the doctor devoted to the disorders of men or of women can delve into psychiatry. The nearer to the single person counsel one can plan, the sooner the work gets under way.

Of the variety of considerations belonging to a relatively complete premarital consultation, several can be lightly touched on whenever the assurance is given that full accord on these matters has been reached by the couple themselves and the two families. Among these are differences in race, religion, social status, education, culture and everyday habits of living and thinking. To books we can relegate study of budgets. But our routine medical consultation may not omit matters on which we have touched, such as discovery of defined attitudes or entrenched shames inhibiting or threatening to inhibit the normal approach to and welcome for full marital relations. Nor may it fail to unearth major ignorances relating to conception and the best time for arrival for the first and subsequent babies. I emphasize the general experience that no one thing brings more couples for premarital advice than call for counsel on control of conception. “We can be married now if we can put off having a baby till we can afford it. Of course we want children. Just as soon as he earns enough so I can give up my job.”

Concerning recommendation of book or pamphlet as part of a standard premarital visit there is a difference

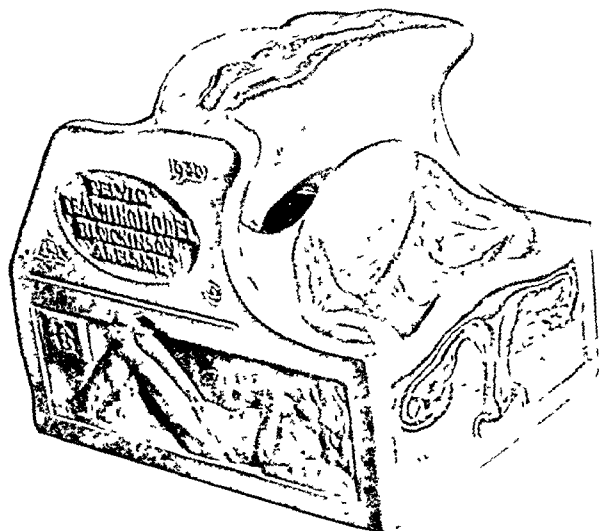


Fig. 2—Same as figure 1, seen from the rear, looking into the pelvis. The cross section is on the rear surface, one half life size. View into vagina through omitted vaginal wall.

of opinion. My own conclusion is that we have to give so much instruction and information at a session that it cannot all be remembered, and couples have blamed me for not prescribing reading. Of course one adjusts speech or text to the intelligence or lack of intelligence

of the pair. And equally of course one always has in mind the absence of a vocabulary, of words regarding anatomy or action that mean the same thing to instructor and instructed. Here the picture—the simple and fully labeled diagram set opposite the finished picturing

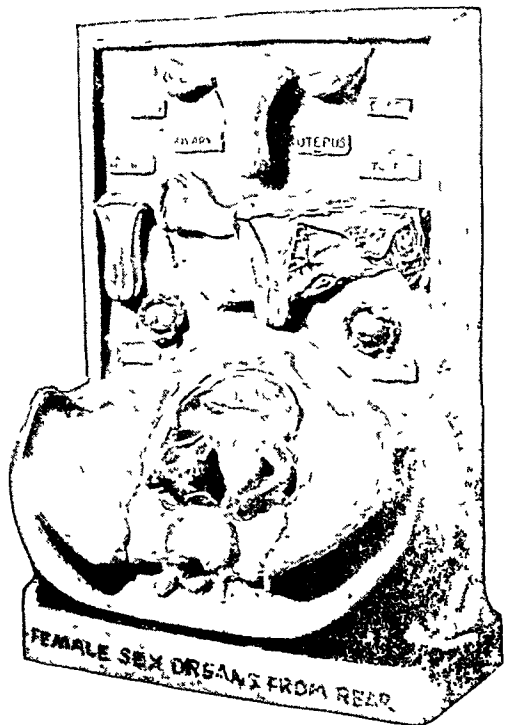


Fig 3—Pelvic organs from rear, an alternative form to those in figures 1 and 2.

—can be made the common language, the vernacular for both teacher and pupil. One may not overdose.

As an integral part of provision of material for instruction in reproduction, I am presenting, in a booth in the Scientific Exhibit, a series of sculptured models, made under the guidance of Malvina Hoffman, by myself and Abram Belskie. All these have a twofold purpose. One is for the medical school, the other for the lay public, the two areas overlapping. The types of pelvis were built on my study of the original stereoscopic films in the three largest series, while the stages of labor were modeled after roentgenograms, many of which were taken directly for this "Birth Series" (and most were published, life size, in the "Birth Atlas"). The public showed an interest in this form of sex education by passing the turnstile of the exhibit at the World's Fair to the number of five thousand a day.

Here I am showing some models for the first time, such as the ten antepartum months, both life size and half size, as well as the stages of labor and the pelvis and fetal head half size. These small dimensions allow for office demonstrations, affording to frequent questions answers in no other way as completely comprehended. Museums and schools thus respond to the reasonable request of children to be told how babies come. Indeed, the normal curiosity concerning delivery and the steps of development of the embryo on the part of the youngsters has been equaled only by that of their parents. Decorous attitudes herein have been noteworthy and consistent.

The new models of the female pelvic organs are mainly for medical teaching in bimanual palpation, covering, in soft rubber materials, the normal findings, early pregnancy, retroversion, anteversion, cystocele,

small fibroids and pessary placement. What their utility in the office will be I do not know.

Even in a group there must be a single person in whom the confidences center and to whom the others report. To the secretary or social worker belong only the impersonal data, and there also the feeling of trustworthiness and the fact of anonymity must be present from the start. In no other of our professional relations is there greater frequency of confession of concealed episodes or tragedies, all the way from a mere transient autoerotism or emotional crush to fixations not removable. We have to elect to advise either full clearance to the partner or else the opposite when in our judgment the incident is put away permanently. These are examples of the need of code and confidence, and of limitation of entries accessible to a group. The problems of budget, of religion, of racial antagonisms, of in-law dominations, of inherited tendencies, of clashing personal habits—these matters can be laid before other members of the group, members whose study is in home economics, sociology, eugenics, child training. It is the intimate sexual experience and the erotic urgencies and the mutual sex balances or antagonisms between the prospective partners that belong particularly to our profession, because it is to us that genital anatomy and adjustment to variations therein and physical technics are most evident as factors in maladjustment. The pelvic examination naturally terminates with instruction in control of conception, as adapted to the findings on examination and as based on evidence of previous coitus. For such advice the doctor will have to qualify by attendance at one of the birth control clinics at a hospital outpatient department or at one of the special extramural clinics. Otherwise he will lack skill in the care of some puzzling conditions not infrequently encountered.

In this brief paper, which condenses four chapters from a book which is in course of publication, the experiences with group service and reference bureaus for



Fig 4—Ten stages of antepartum life called "Birth Prelude." Made on two scales, life size and also half life size (diameter 34 and 17 inches).

marriage counsel cannot be readily summarized. The most extensive experience is that of Germany with many hundred thousand couples. The lever was the marriage loan, the result a health examination unprecedented, a systematic start on eugenic union, an instructed pair

of future parents. The student of the subject is referred to detailed reports on many developed projects in America to guide him, such as those of Burgess⁴ concerning details of course and personnel in seventy-three colleges and of the National Association of Deans of

that it determines an important item of advice; namely, whether there exists a need for gradual finger-stretch by the bride—or husband—on account of one of three conditions. One is narrowness and tenderness; another resistance of the thick encircling sling of pelvic floor muscles as in a tennis or horseback addict; or just unusual thickness of the hymen structure. This last calls, in a few instances, for nicking with scissors in a couple of places after local anesthesia. In the presence of any opening that is small and inelastic, forcible office dilation is unsurgical and slow in healing. It produces laceration and contusion, whereas tiny incisions give ample room and quick repair of surface. Out of many, a hundred virgin hymens, self stretch has met the need except in eleven instances, plus those belated visits too late for trial of gradual dilation.

The two commoner findings of import are infantile dimensions of the vulva pointing toward that infantile type of uterus responsible for many sterilities, and the high degree of (symptomless) retroversion calling for early replacement in pregnancy to avoid spontaneous abortion.

The Davis and the Terman couples, embracing nearly two thousand intelligent Americans, agree in reporting 85 per cent of their marriages as happy, while the proportion of physical defect in adjustment runs toward half, as in my own series. Although the Terman-Burgess contention is that this large figure is to be interpreted as unloading on the physical what is really psychic, we as counselors may not omit any step in either examination or instruction that might cut down the "orgasm inadequacy" on her side and that large proportion of premature finish on his side, which is believed to run over 10 per cent. We must face actualities. To obtain and maintain leadership in our depart-



Fig. 5—Steps in delivery, in ten panels, half life size, called "Birth Relief," with diagrams fully labeled on the doors, which can be closed over (24 by 38 inches)

Women for one hundred and two, reports of the projects of Poponoe in Los Angeles, Mudd in Philadelphia, Groves in Chapel Hill, Foster in Detroit, Dickinson,⁵ Kopp and Folsom.⁶ Here in Ohio one finds two of the best examples in Cleveland and Cincinnati.

Objections sometimes raised to local examination of the woman are concerned with the question of exposure and of reluctance of the fiancé (spelled "financé" in one of my books, passing all proofreaders). There is fear of removal of evidence of virginity as well as apprehension of discovery of nonvirginity. All these reasons are on the wane. As to the hymen after the doctor's examination, we give assurance that virginity remains, anatomically. Neither the male index finger nor—where its use is indicated—the virgin-sized vaginal speculum expands the opening, the almost constant diameter, of the virgin hymen to that size required to admit the male. A chief value of the examination is

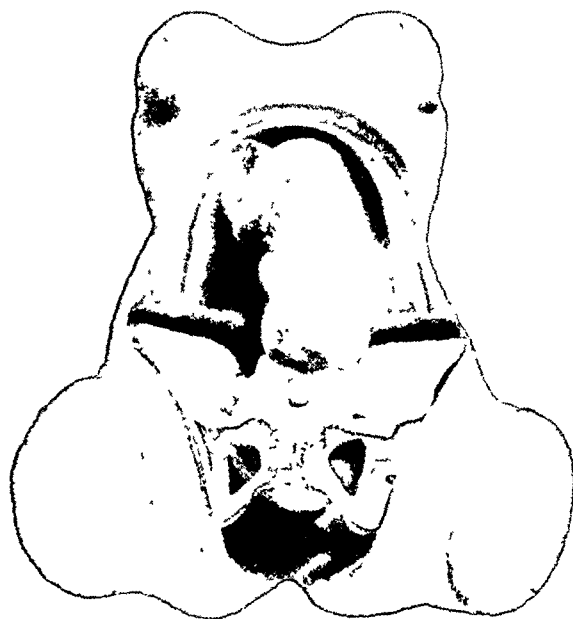


Fig. 6—Delivery manikin, with rubber baby, half life size, for office desk or medical college. Abdominal cover removed. Four types of pelvis interchangeable. (All models are copyrighted.)

ment of marriage counsel and education looking toward successful family life, we shall not boggle at study of sex adjustment. In the sweep of the active discussion that is placing the family at the very focus of betterment of society and community and morality, the field of our contribution is not unclear.

4. Burgess, J. S.: A Joint Course on Marriage at Temple University, 1930.

5. Dickinson, R. L.: Control of Conception, Baltimore, Williams & Wilkins Company, 1938, p. 390.

6. Folsom, J. K.: Plan for Marriage, New York, Harper & Brothers, 1938.

Any community that waits to give training that anticipates marriage until patterns are set—or well on the way toward setting—into frigidity and impotence and divorce—or in any degree toward promiscuity and homosexuality—is guilty of unpardonable lack of courage and foresight. Prominent figures of the community, educated largely at its expense for leadership, who sidestep that leadership, will not be counted blameless, and this holds especially true for those regions wherein physical health interlocks with mental-moral soundness. Our profession has no option. We have been given the job to discover the ties between goodness and gonads, between the new hormones and the new harmonies, to take part in the new programs for homes-for-life. The colleges and the country are rapidly awakening to the need of guidance in this protective function and the number of books on the sex life that are being issued call for a reasonable share in responsibility for the printed word.

I am proposing, then, that, for medical aspects of instruction for marriage, both close to the event and in long-range education for it, we undertake formal action. The Association has circulated a million pamphlets on sex education. Let us foster further participation by the American Medical Association. Let this section with the help of the neurologists and psychiatrists urge collaboration with various research groups working in collateral fields and with the best of the agencies active in the region of sex education. Let our representatives appear on the program of those conferences on the family which have been started in several parts of the country. And, as individual men and women, let us fully face our responsibility for the mental hygiene of marriage, in penance for some of our neglects and timidities.

Success in marriage and in parenthood is teachable. Enlist effort enough, use intelligence enough, be courageous enough in this era of swift change in mores, and divorce and disaster in home making can be minimized, security safeguarded, a new outlook forwarded.

2 East One Hundred and Third Street.

ABSTRACT OF DISCUSSION

DR. SOPHIA J. KLEEGMAN, New York: There is as much human suffering, illness and death as the result of destructive human relations as can be wrought by any virus or germ. In my practice I try to see the couple two to three times before marriage, if the interval will allow, and once after marriage. One session is devoted to the woman and one to the man. If the hymen needs dilation, I prefer stretching to cutting. A cotton pledget soaked in 35 per cent cocaine solution topically applied to the hymen is followed by the introduction of graduated cone-shaped dilators made of a plastic material. Contraceptive advice is the most common request at the start of most marriages. In this instance I do not hesitate to advise against contraception when examination discloses evidence of lowered fertility. The doctor giving contraception to the couple will not keep them from having children; they will have children when they want them. It is a question as to whether we are going to let them have a safe method or leave them to unsafe methods. A good book is a helpful supplement to the personal interview; it alone can meet the particular needs and fears, which differ with each couple. I find that the two sexes are equally in need and equally grateful for this phase of instruction. In the group of prospective husbands, physicians seem just as uninformed about the elementary physiology of sex relations as any of the other groups. Many criticize any program on the basis of what it cannot accomplish. In this field we have worked backward. When seeing the maritally maladjusted, one soon finds that in

the majority of instances many of the conflicts and much of the maladjustment was due either to ignorance or more often to misinformation. I would risk letting nature take its course except that in our society nature is not allowed to take its course. Our young people come to marriage already handicapped by all sorts of inhibitions and taboos. Fears and anxieties are evenly divided between the sexes. Of this, I am sure: the couple having the benefit of a wise premarital interview start their marriage with a sense of security which they would not have otherwise. In addition, they have made a contact to whom they will return as new problems and conflicts arise. That is an important asset, because in most marriages, if maladjustments are taken care of early, before resentments and permanent damage take place, the cure is often simple. Premarital examination and marital guidance are by no means a panacea for the ills of the world, but they are a neglected phase of medical practice and an effective and beneficial step toward fulfilling the betterment of human relations.

DR. MARIE PICHEL WARNER, New York: In a large New York City college for men where I lectured on social hygiene, 48 per cent of the students admitted premarital sexual experience. In a group of two hundred premarital couples seen in private practice, 62 per cent of the women and 50 per cent of the men had not had sexual experience. Ninety per cent of the women felt compelled to work after marriage. Eighty-five per cent of this group requested contraceptive information. The premarital procedure which I follow is to explain to the couple, separately or together, as suits their wishes, sex and reproductive anatomy, using a sex atlas and a model of the female pelvis. The inexperienced bride benefits by actually being shown the location of her vaginal orifice and the technic of douching, as well as positions assumed during coitus. Inspection of the hymen should be made in every case, so that the bride may be advised concerning the probable amount of discomfort or bleeding she may anticipate. Medical dilation of the hymen premaritally is suggested only when any unusual condition exists. For septate hymens the electric cautery is used to remove the band. Whether to disclose pelvic pathologic conditions discovered at the time of the examination just preceding marriage is a delicate question to be decided in each case. Some literature is important, but too much reading often proves confusing. Nothing can take the place of a good premarital medical consultation, with a physician willing to discuss marriage problems in all its phases. Marriage counseling is an important part of medical practice.

DR. ANNA K. DANIELS, New York: There is one point in the premarital examination that I would like to stress for preventing early marital maladjustment on the physical side, and that is always to take a fresh drop of the vaginal secretion for examination under the microscope. I find that a great many virginal brides have a *Trichomonas vaginalis* vaginitis lying dormant which will be called into activity by intercourse. In her ignorance of the situation, the bride invariably will think that she has acquired an infection from her husband and many early marriages that end in rapid divorce are due to that factor. If by a simple examination the physician prepares the young woman for the situation, and even in some cases delays the marriage date until the vaginitis is completely cleared, it will be worth the effort.

DR. ROBERT W. LAIDLAW, New York: The success of a marriage counselor working in the field of sexual adjustments is in direct proportion to his ability to develop in his patients mature, understanding, uninhibited emotional attitudes toward sex. For the counselor to impart factual information is important, but the way in which he imparts it is more important. Only by being emotionally free oneself can one adequately help patients to become so. Medical schools have been, and to a lesser extent still are, woefully inadequate in helping the young doctor to become well oriented emotionally as regards his own sexual nature. Experience, knowledge, technical skills, all these are important, of course, but no one of these is as important as emotional integration.

DR. WILLIAM H. WEIR, Cleveland: In our Maternal Health Clinic, special sessions are now held for premarital examinations. Many of the patients are referred by the clergy and others are sent in by physicians. This particular clinic is

under the control of the medical profession, and all its activities must be approved by an advisory board of representative physicians. It is as much concerned with promoting pregnancies in certain patients as it is in giving contraceptive advice to others. The latter function naturally renders it impossible for us to participate in our Community Fund, and as we are entirely dependent on voluntary contributions we find considerable difficulty in dealing with the increasing demands made on the clinic.

THE DETOXIFYING ACTION OF VITAMIN C (ASCORBIC ACID) IN ARSENICAL THERAPY

I. ASCORBIC ACID AS A PREVENTIVE OF REACTIONS OF HUMAN SKIN TO NEOARSPHENAMINE

HERMAN N. BUNDESEN, M.D.
HANS C. S. ARON, M.D.
REGINA S. GREENEBAUM, M.D.
CHESTER J. FARMER, M.A.
AND
ARTHUR F. ABT, M.D.
CHICAGO

The reduction of the toxic side effects of chemotherapeutic drugs is one of the major problems of chemotherapy. During the first period of the development of chemotherapy every effort was made to modify the chemical constitution of the products synthesized in order to increase their parasitotropic properties and to reduce their organotropic affinities.

More recently it was found that the toxicity of some well established chemotherapeutic agents may be reduced by giving simultaneously certain other substances which produce a detoxifying effect. Ehrlich,¹ in one of his earliest papers on chemotherapy, pointed out that "reduction" is the most important chemical reaction in the detoxifying process of chemotherapeutic agents, especially the arsphenamines.

Among the various substances recommended and applied as detoxifying agents, vitamin C (1-ascorbic acid) stands in a unique position. While most of the other substances are products foreign to the body, ascorbic acid is one of the most powerful physiologic reducing agents.

Animals that are able to synthesize ascorbic acid, such as the rat, respond with an increased formation of this substance to toxic doses of a great number of drugs.² Man is not able to synthesize it. In man, the vitamin C for detoxification must come either from the ingested food or from the body stores. Syphilitic patients when given neoarsphenamine in therapeutic doses had a more or less decided decline of their plasma ascorbic acid levels.³ The drop in the plasma ascorbic

acid was especially pronounced in patients who showed symptoms of intolerance to arsenicals.

The influence of ascorbic acid on the sensitization of guinea pigs to arsphenamine was first reported by Sulzberger and Oser.⁴ In 1937 ascorbic acid was recommended for the detoxification of arsphenamines in human therapy by Dainow.⁵ Since his publication other reports⁶ have appeared confirming Dainow's⁷ observations, but a number of authors⁸ have not obtained as favorable results.

For more than a year we have attempted to desensitize patients hypersensitive to arsenical drugs by building up and maintaining their plasma ascorbic acid level at an optimal range.⁹ In the course of this clinical and biochemical study some observations were made proving that ascorbic acid definitely counteracts the toxic action of neoarsphenamine and mapharsen in man.

It is well known that solutions of arsphenamine become oxidized if they are exposed to air and that such oxidized solutions are much more likely to cause toxic side effects than freshly prepared solutions of the same drug.

In experiments on mice Dainow⁵ showed that the injection of a freshly prepared solution of arsphenamine killed 35 per cent of the animals. When the same solution was allowed to stand for from three to five hours, its toxicity increased to such a degree that when injected in the same amounts 70 per cent of the mice were killed. However, when ascorbic acid was added to the freshly prepared solution, its toxicity did not increase. On the contrary, it was lower than the toxicity of a corresponding freshly prepared solution of arsphenamine alone. Only 17 to 23 per cent of the mice were killed by the ascorbic acid-arsphenamine mixture. Dainow concluded that by the addition of ascorbic acid the oxidation of the arsphenamine radical was inhibited not only *in vitro* but also in the tissues.

4 Sulzberger, M. B., and Oser, L. B. Influence of Ascorbic Acid of the Diet on Sensitization of Guinea Pigs to Arsphenamine, *Proc. Soc. Exper. Biol. & Med.* **32**: 716, 1935.

5 Dainow, J. Intolerance aux arsenobenzènes et vitamine C, *Presse med.* **45**: 1670, 1937.

6 Landfisch, S. Synthetic Ascorbic Acid: New Auxiliary Remedy in Arsphenamine Therapy, *Polska gaz lek* **16**: 575, 1937; *abstr.*, *J. A. M. A.* **109**: 834 (Sept. 4) 1937. Diaconescu, N., Constantinescu, V., and others. Vitamin C in Therapy of Arsphenamine Intolerance, *Rev. san. mil.*, Bucuresti **37**: 627-630, 1938. Biss, E. Grave Erythroderma Due to Arsphenamine, Cases Cured by Cevitamic Acid, *Rev. med. de la Suisse Rom.* **58**: 603, 1938, quoted by Dainow.⁵ Montesano, V., Jr. Use of Vitamin C in Prevention of Arsphenamine Intolerance, *Giorn. di dermat. e sif.* **79**: 1031, 1938. Conrad, A. H., Conrad, A. H., Jr., Mapother, P., and Weiss, R. S. Lichen Planus Treated with Bismuth Arsphenamine Sulfonate (Bismarsene), *South M. J.* **33**: 721-729, 1940. Vail, A. D. Influence of Vitamin C Therapy on Arsenical Sensitivity, *J. Missouri M. A.* **38**: 110-120 (April) 1941.

7 Dainow, J. Considerations sur la pathogenie de l'érythrodermie arsenobenzolique role de la vitamine C, *Ann. de dermat. et siph.* **10**: 139, 1939.

8 These include Santiago, A. Klinische Bemerkungen ueber die Verträglichkeit des Neo-salvarsans, *Actas dermo-sif.* **29**: 299-302, 1938, *abstr.*, *Zentralbl. f. Haut u. Geschlechtskr.* **60**: 74, 1938.

Horne, G., and Scarborough, H. Capillary Resistance in Toxic Manifestations of Antisyphilitic Therapy, *Lancet* **2**: 66, 1940.

Friend, D. G., and Marquis, H. H. Arsphenamine Sensitivity and Vitamin C, *Am. J. Syph. & Ven. Dis.* **22**: 239-242, 1938.

Grunwald, C. Vitamin bei Salvarsanüberempfindlichkeit, *Dermat. Wchnschr.* **110**: 70, 1940.

Falconer, E. H., Epstein, N. N., and Mills, Edith S. Purpura Hemorrhagica Due to Arsphenamines Sensitivity in Patients as Influenced by Vitamin C Therapy, *Arch. Int. Med.* **66**: 319 (Aug.) 1940.

Welker, A. Salvarsanunverträglichkeit und Vitamin C, *Klin. Wchnschr.* **19**: 1281, 1940.

Corma, F. E. Postarsphenamine Dermatitis. The Relation of Vitamin C to the Production of Arsphenamine Sensitivity, and Its Use as an Adjuvant to Further Arsphenamine Therapy in Patients with Cutaneous Hypersensitivity to the Arsphenamines, *J. Invest. Dermat.* **4**: 81-93, 1941.

Perry, Demetrio A. vitamina C e os estados de intolerância pelo ouro, bismuto e arsenbenzois, *Hospital Rio de Janeiro* **17**: 281-306, 1940.

Schneidewind, A., and Trytenberg, S. Nuevo tratamiento de las eritrodermas arsenicales, *Rev. Assoc. med. argent.* **51**: 102-104, 1940.

9. Merck & Co., Inc., Rahway, N. J., supplied the Cebione (ascorbic acid) and Hoffmann-La Roche, Inc., Nutley, N. J., the vitamin C forte (sodium ascorbate).

H. J. Fagen and J. F. Bimmerle gave the biochemical analytic data reported here. Miss Margaret A. Delaney kept the records and gave dietary advice to the patients.

From the Department of Chemistry and Pediatrics, Northwestern University Medical School, the U. S. Public Health Service and the Department of Health, Chicago.

Dr. O. C. Wenger, Senior Surgeon, U. S. Public Health Service, furnished the facilities and opportunity of studying patients attending the Municipal Social Hygiene Clinic, Dr. John J. McShane, Chief, Division of Communicable Disease, Department of Public Health, State of Illinois, Dr. John L. White, Director of Laboratories, Chicago Health Department, and Dr. G. G. Taylor, Director of the Clinic, cooperated in this work.

1. Ehrlich, Paul. Ueber den jetzigen Stand der Chemotherapie, *Ber. d. deutsch. chem. Gesellsch.* **42**: 1-31, 1909.

2. Longenecker, H. E.; Fricke, H. H., and King, C. G. The Effect of Organic Compounds upon Vitamin C Synthesis in the Rat, *J. Biol. Chem.* **135**: 492-510, 1940.

3. Farmer, C. J., Abt, A. F., and Aron, H. C. Influence of Arsenicals, Bismuth and Iron on the Plasma Ascorbic Acid Level, *Proc. Soc. Exper. Biol. & Med.* **44**: 495-499, 1940.

EFFECT OF ASCORBIC ACID ON NEOARSPHENAMINE
AND ON MAPHARSEN IN VITRO

Our studies on arsenicals extend and in essential points support Dainow's work. In preparing solutions of neoarsphenamine and mapharsen with and without the addition of ascorbic acid, we made the following observations:

Freshly prepared solutions of neoarsphenamine vary in intensity of yellow color according to the concentration (5 per cent to 30 per cent). After standing in open containers these solutions become progressively darker within one or two hours and after twenty-four hours they become a brownish black. When the containers are filled and stoppered, thus excluding air and avoiding oxidation, no darkening occurs.

If enough ascorbic acid is added to the neoarsphenamine solution to make a concentration of 10 to 20 per cent, the yellow is intensified to orange. When allowed to stand under the same conditions as the untreated neoarsphenamine solutions, the solutions of neoarsphenamine plus ascorbic acid do not change in color. No darkening or formation of a brownish black product occurs. These solutions, when prepared in higher concentrations, may form precipitates, but the orange-yellow of the freshly prepared solutions is maintained for several days without any appreciable change.

Still more impressive is the protective action of ascorbic acid on solutions of mapharsen. In a concentration of 3 per cent this arsenical forms a clear, faintly yellow solution. On standing for one hour, it turns darker, later becomes brown and after twenty-four hours is transformed into a turbid brownish black solution. However, when ascorbic acid in amounts sufficient to make a concentration of 10 to 20 per cent is added to the freshly prepared 3 per cent mapharsen solution, it loses its faint yellow color. This solution remains clear and colorless for several days. Even after a week, the solution is still pale yellow or tan, like a mapharsen solution that has stood but one or two hours without the addition of ascorbic acid (fig. 1).

These experiments showed that solutions of neoarsphenamine and of mapharsen may be completely protected from oxidation for at least twenty-four to forty-eight hours by the addition of ascorbic acid. The significance of this observation became apparent after we began to make patch tests on patients hypersensitive to arsenicals.

PATCH TESTS

In our study of patch tests we compared the reaction of the skin to patches soaked in solutions of arsenicals to which ascorbic acid had been added with those obtained with identical concentrations of these drugs without the addition of ascorbic acid. When the patches soaked in neoarsphenamine or mapharsen solution alone were removed for reading after twenty-four to forty-

eight hours, we noticed that their color was identical with that of the corresponding solution of the arsenical which had stood freely exposed to air for the same length of time. The freshly prepared neoarsphenamine patch is yellow. When removed after twenty-four hours, it is dark brown. The mapharsen patch is white when fresh and after twenty-four hours becomes tan to brown. The patch containing neoarsphenamine plus ascorbic acid is orange at the end of twenty-four hours, while the mapharsen and ascorbic acid patch is pale yellow.

The protective action afforded the human skin against arsenical toxicity by the local application of ascorbic acid was first demonstrated by our patch tests. Thirty-eight of 115 patients had a definitely positive cutaneous reaction to the 30 per cent neoarsphenamine solution, as defined by Schoch.¹⁰ In 32 of the 38 patients the cutaneous reaction to neoarsphenamine was completely suppressed by the addition of ascorbic acid; not the slightest cutaneous change was visible. The large number of vesicles or even bullae produced by the neoarsphenamine patch was in striking contrast to the smooth and normal skin under the patch containing neoarsphenamine plus ascorbic acid. The differences may be clearly seen from figures 2, 3 and 4.

CORRELATION OF SYMPTOMS OF INTOLERANCE
WITH RESULTS OF PATCH TESTS

One hundred and fifteen patients were subjected to patch tests. All but 18 were tested because they had

Fig. 1—Tube A, 3 per cent mapharsen + 10 per cent ascorbic acid after forty eight hours' exposure to air; tube B, 3 per cent mapharsen after forty eight hours' exposure to air

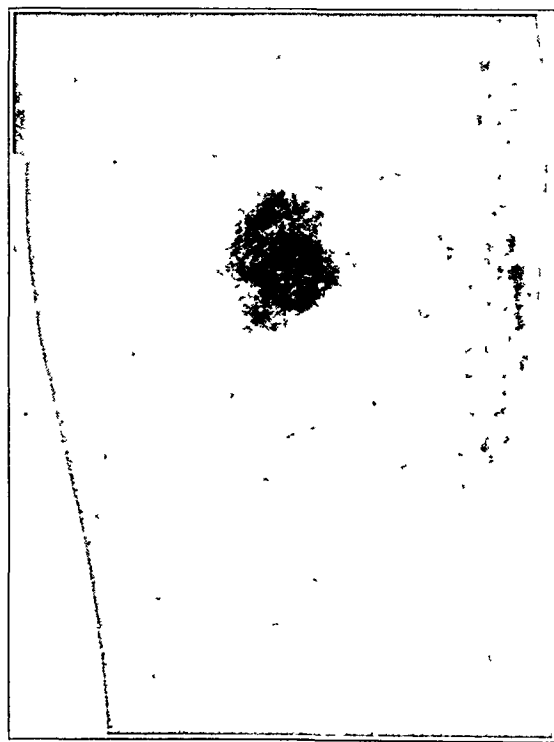
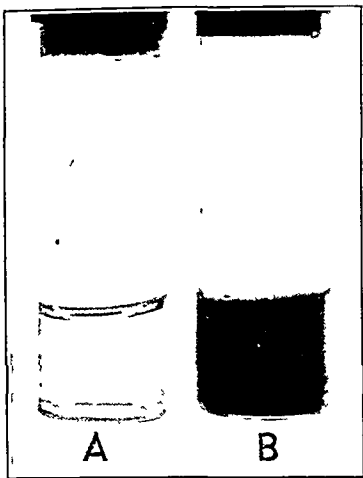


Fig. 2—Patch test after twenty four hours upper, 30 per cent neoarsphenamine; lower, 30 per cent neoarsphenamine + 20 per cent ascorbic acid

previously shown some symptoms of intolerance to arsenicals. Seventy-four patients gave no cutaneous reaction, 38 gave positive and 3 gave doubtfully positive

10 Schoch, A. G.: The Patch Test and the Element of Syringe Contamination, *J. A. M. A.* 98:1367 (April 16) 1932; Arsenamine Dermatitis—Attempted Sensitization to Neoarsphenamine and Further Observation on the Patch Test, *Arch. Dermat. & Syph.* 30:672 (Nov.) 1934. Schoch, A. G.; Alexander, L. J., and Long, W. E.: Mapharsen in the Treatment of Forty Patients Following Arsenamine Dermatitis, *ibid.* 42:919-932 (Nov.) 1940.

reactions. We have attempted to correlate the previous symptoms of intolerance with the results of the patch test. The patients, grouped according to the predominant symptoms of intolerance, showed response to the patch test as given in the table.

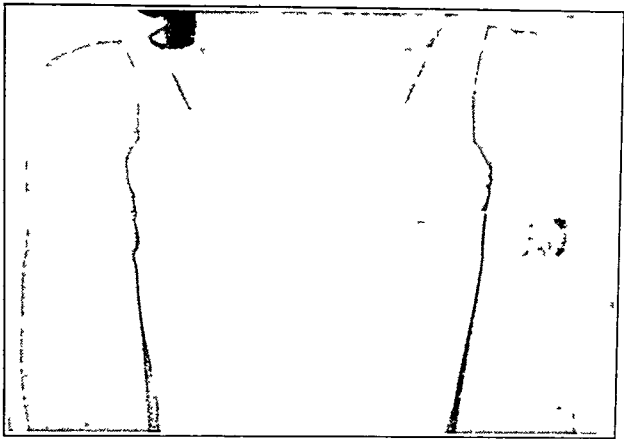


Fig 3—Patch test after seventy two hours left arm, 30 per cent neoarsphenamine, right arm, 30 per cent neoarsphenamine + 10 per cent ascorbic acid

APPLICATION OF THE RESULTS IN ANTISYPHILITIC THERAPY

The general significance of the patch test itself is secondary. The prevention of reactions to neoarsphenamine and the method of detoxifying it are primary. The number of patients who have severe symptoms of intolerance to neoarsphenamine is still considerable. In the recent reports¹¹ of the medical corps of the United States Navy the following figures are given: During the fifteen year period from 1925 to 1939, 1,301,913 doses of neoarsphenamine were administered; 305

tion to neoarsphenamine is fully prevented by ascorbic acid should be able to tolerate intravenous therapeutic doses of neoarsphenamine if the ascorbic acid in the circulating blood is maintained at a level high enough to inhibit the formation of toxic products of oxidation. We shall report the results of this method of treatment of patients previously sensitive to arsenicals in a subsequent paper.

SUMMARY

1. When solutions of neoarsphenamine or mapharsen are left in contact with air, brownish black oxidation products are formed.
2. This oxidation can be prevented for a period of at least forty-eight hours when 1 part of ascorbic acid by weight is added to 3 parts of neoarsphenamine. Mapharsen solutions may be protected from oxidation in a similar way.
3. The same oxidation takes place when patches soaked in solution of neoarsphenamine or mapharsen are applied to the skin. When ascorbic acid is added to the patch test solutions these changes can be completely prevented.
4. A total of 115 patients was subjected to patch tests with neoarsphenamine. Eighteen of these patients were controls who previously had never had symptoms of intolerance to arsenicals. Four of the 18 control patients had positive reactions to the patch tests and were designated as "pseudoreactors." Of the remaining 97



Fig 4—Patch test after forty eight hours upper, 30 per cent neoarsphenamine, lower, 30 per cent neoarsphenamine + 10 per cent ascorbic acid

Responses to Patch Test

Previous Symptoms of Intolerance	Neoarsphenamine Patch Test		
	Positive	Doubtfully Positive	Negative
Exfoliative dermatitis	4		0
Dermatitis	6	..	5
Erythema or rash	6	..	6
Pruritus	0		16
Severe icterus	1		2
Vomiting, diarrhea or nausea	11	1	17
General reactions chills, fever, nitritoid	6	2	14
No symptoms of intolerance	4	.	14
Total	38	3	74
Grand total	115		

severe reactions and 49 deaths were recorded following these injections, or 1 death or severe reaction to every 3,678 administrations of the drug. In addition, 618 mild reactions were recorded, giving a ratio of 1 reaction to every 1,346 doses of neoarsphenamine administered. Any prospect of a way to reduce the incidence of these unfortunate reactions should be vigorously pursued. Our studies give promise that the majority of hypersensitive patients whose local cutaneous reac-

patients who had previously shown symptoms of intolerance, 60 gave no reaction to the patch tests of neoarsphenamine. The previous symptoms displayed by many in this group of 60 patients may have been caused not so much by a sensitivity or allergy to

11 Stephenson, C S, Chambers, W M, and Anderson, L T Toxic Effects of Arsenical Compounds as Administered in the United States Navy in 1939 with Special Reference to Arsenical Dermatitis, U S Nav M Bull. 38: 587-597, 1940, Toxic Effects of Arsenical Compounds as Employed in the Treatment of Diseases in the United States Navy, ibid 39: 139-152, 1941.

nearsphenamine but were rather manifestations of an abnormal pharmacologic response to the drug.

5. A method was developed which demonstrates that typical cutaneous reactions to nearsphenamine in the majority of hypersensitive patients can be completely prevented by the addition of a sufficient amount of ascorbic acid to the nearsphenamine solution used for patch testing. In 38 patients who gave strongly positive reactions to patch tests with 30 per cent nearsphenamine solutions, control patch tests were simultaneously performed with the same nearsphenamine solution with added ascorbic acid. Under the patch with added ascorbic acid not a trace of any reaction was noticeable in 32 out of the 38 positive reactors. All but 1 of the 6 remaining patients showed a strong attenuation of the cutaneous reaction under the patch containing nearsphenamine plus ascorbic acid.

6. At the time that the patch test was performed the plasma ascorbic acid level was determined on 110 patients. The plasma ascorbic acid level does not exert a determining influence on the outcome of the patch test. Even in patients receiving supplements of ascorbic acid the patch test remained positive.

7. The small skin area to which the patch test is applied can receive but a limited amount of ascorbic acid from the circulating blood, even though the plasma level may rise to high values. For this reason the ascorbic acid present in the circulating blood cannot exert as great an effect in preventing cutaneous reactions to the patch test as does the local application of ascorbic acid.

8. In the circulating blood itself a much higher ratio of ascorbic acid to therapeutic doses of nearsphenamine can be established. This ratio may reach the proportion (1:3) which, when used locally, was effective in preventing reactions on the human skin.

9. These studies outline a procedure which promises to assist in the prevention of reactions to therapeutic doses of nearsphenamine in the great majority of patients.

10. To detect patients in whom it would be hazardous to attempt desensitization to nearsphenamine by means of ascorbic acid, the patch test may be done with 30 per cent nearsphenamine plus 10 per cent ascorbic acid, omitting the test with nearsphenamine alone. Patients who react positively to this patch test (arsenical plus ascorbic acid) will almost certainly not be able to tolerate nearsphenamine better with ascorbic acid than without it. This group of patients is as yet very small.

11. A subsequent report will be given of the results obtained in treating hypersensitive patients in whom arsenical treatment had previously been regarded as absolutely contraindicated.

54 West Hubbard Street and 303 East Chicago Avenue.

The Dark Field Microscope.—It seems to me after many years of experience with all the dyes used in microscopy for bright-field work, and with all the dark field methods so far devised, that the future physicist, chemist and biologist will feel as much handicapped without the ultra-microscope and the dark field microscope as would the astronomers if they had no clear, dark nights, and could work only in the daytime.—Gage, Simon H.: *The Microscope*, New York, Comstock Publishing Company, Inc., 1941.

INJURIES OF THE INTERNAL SEMILUNAR CARTILAGE

POSSIBLE PREDISPOSITION TOWARD; SYMPTOMS
AND TREATMENT

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AND

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The internal semilunar cartilage, like so many other medical subjects, has amassed a large amount of literature. Some is necessary repetition, but this implies no reason for a further rehash of old facts. This paper is written with apologies for the old and accepted matter which it contains; but such reiteration seems necessary for clarity and emphasis. Here we wish (1) to postulate a possible predisposition toward injuries of the cartilage in certain body types, (2) to state a seeming rationale for the treatment of such injuries and (3) to present a statistical summary to dispel prevalent beliefs as to the more common symptoms of injury to the cartilage.

The menisci are developed from exactly the same primitive mesenchyme as are the femur and the tibia. In the 40 mm. embryo the knee joint is divided into four compartments by a solid mass of mesenchyme extending across the joint. This meets and crosses the sagittal septum formed by the embryonic crucial ligaments in the midline. Even at this early stage separation can be seen between the anlage of the femur and the upper surface of the semilunar cartilage.

In the 60 mm. embryo the separation, both from the femur and from the tibial head, is definite. The mesenchymal cells which lay in the coronal plane now lie vertically in the region which will later be occupied by the lateral ligament. This last structure soon develops a separate individuality.

In the four month embryo the meniscus is more fibrocartilaginous than in later life, and not until the fourth year does the semilunar cartilage develop the characteristics which it is to bear throughout life. It is occasionally stated that the menisci arise as invaginations of the tissues which form the lateral ligament. From studies containing this thesis it appears that the lateral ligaments and the menisci arise from a common stalk and neither is responsible for the other's development.

The anatomy of the internal semilunar cartilage is well known. We should like to emphasize, to clear a later point, the fact that the internal semilunar cartilage is vascular in its peripheral portion and is avascular toward the middle or free margin. This anatomic fact seems important in the prognosis of injuries to the semilunar cartilage.

There are four types of internal semilunar cartilages: (a) those whose front ends are much narrower than are the rear ends, (b) those in which the front ends are equal to those of the rear, (c) those which are semilunar and (d) those which form a nearly perfect circle. The combination of these mutants makes for a wide variety of possible anatomic findings. We cannot demonstrate a predisposition to injury in any particular anatomic type. We have found injury as frequently in one type as in another.

What functions has the semilunar cartilage? A few are given further on in this paper. It is probable that no one of these completely explains the functions of

the semilunar cartilage. Certainly the cartilage acts in a different manner in different positions. Theories concerning function have been: A. The internal semilunar cartilage acts exactly as does a row of ball bearings in facilitating the rotation of the knee which is neces-

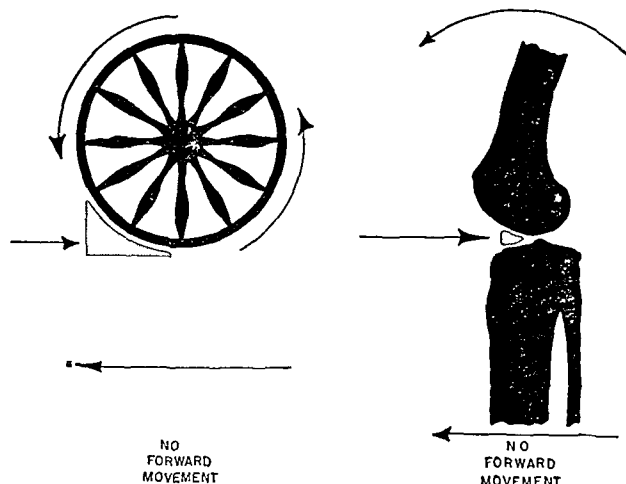


Fig. 1.—“Wagon chock” aspect of the function of the cartilage—to prevent undue forward gliding. (Figures 1 to 6 illustrate the mechanical functions of the meniscuses.)

sary to the “locking home” motion at the end of extension. B. The semilunar cartilage may act as a cushion, particularly when great force is brought on the flexed knee, as in a fall. C. The wedge which the semilunar cartilage presents between the joints compensates in part for the incongruity between the male femur and the female tibia. This may be valuable in protecting the knee against blows from the lateral side. D. The brothers Webber expressed the belief that the internal semilunar cartilage acts exactly as does a chock under a wagon wheel, preventing undue forward gliding of the femur on the tibia. E. The internal semilunar cartilage may act as a pressure-reducing mechanism, so that by its migrations it tends to equalize intra-articular pressure, moving inward when this pressure is decreased and pushing outward when the reverse occurs. F. The semilunar cartilage acts as a “Mitchell pad,” applying a layer of lubricating synovial fluid in its migrations.

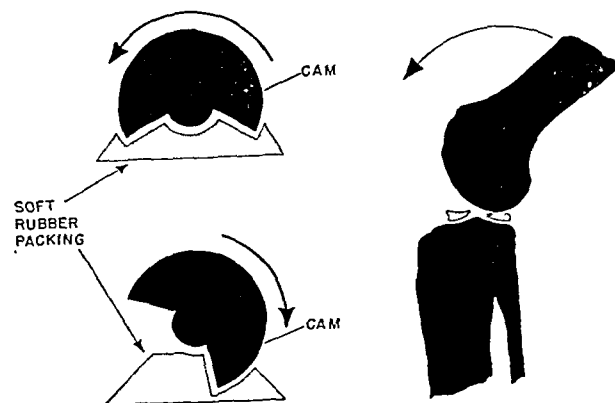


Fig. 2.—The cartilage compensating for the incongruity between the male femur and the female tibia.

Injuries of the cartilage are simply intolerable strains. These may be occasioned by extra-articular violence, such as a blow on the outer side of the knee causing a part of the cartilage to shift immediately inward while

a portion of it remains fixed between the tibial head and the femoral condyle. A common injury is caused by fixation of the femur with flexion and rotation of the leg. In this type of injury the free margin of the cartilage is fixed while the outer edge is either pulled by the coronary ligament or pushed by the moving tibial head. The reverse of this process can occur and produce injury when the leg is fixed and the femur is flexed and rotated. Injuries of the cartilage may be either push or pull injuries and frequently are both.

To elucidate a later point, the types of injury are outlined. An internal semilunar cartilage may be fractured in its anterior, middle or posterior portion. It may be torn free from the coronary ligament or the injury may be a part of an injury of the anterior crucial ligament.

1. Simple tears into the anterior crucial ligament occurred in 3.77 per cent of our cases.
2. In 20.75 per cent of our cases this was combined with an anterior dislocation of the internal semilunar cartilage.
3. Simple bucket handle fractures through the middle portion of the cartilage, which did not pass through either margin, occurred in 30.18 per cent of our cases.

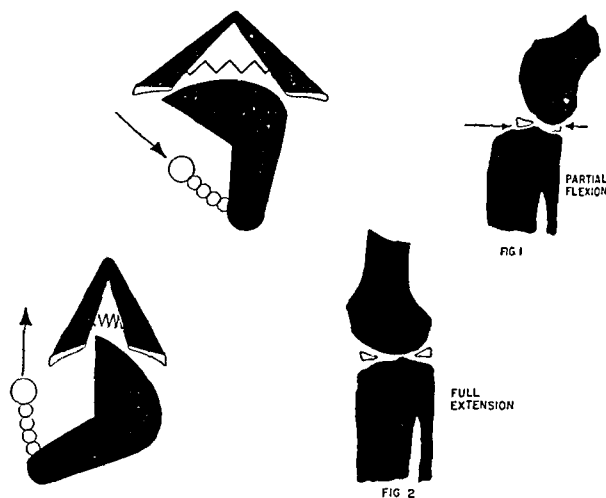


Fig. 3.—Migrations of the cartilage to equalize interarticular pressure.

4. In 18.86 per cent of cases the bifurcation between the anterior crucial ligament attachment and the transverse ligament was elongated to allow an anterior longitudinal tear.
5. In 11.32 per cent of cases, the bucket handle tear through the middle portion of the cartilage extended through either margin. This type has been named compound bucket handle fracture.
6. In 7.54 per cent the tear was through the posterior portion.
7. In only 3.77 per cent was the avulsion of the cartilage sufficient to allow a dislocation of the posterior end.
8. In 3.77 per cent a small chip was torn off the upper surface of the anterior portion of the cartilage to produce a chip or slice fracture.

Forty-five per cent of these injuries occurred in or passed through the avascular portion of the cartilage. In only 30 per cent of cases was there dislocation or disarrangement of structure in such a manner as to produce or allow locking of the knee joint in flexion or extension.

Healing does occur. We have no evidence that true cartilage is ever reformed in an area of fracture. All old injuries examined by us histologically showed union of the fracture by fibrous tissue. This is perfectly logical, since one could not expect a return to the original

mesenchymal tissue and a development of the cartilage from that in a traumatized area. Healing by scar tissue, therefore, is the best that can be expected.

It is not uncommon when examining cartilages in the dissecting room to find old injuries in which scars have replaced cartilage. It is usual to find some replacement by scar tissue in every cartilage more than 45 years old. In this circumstance it is impossible to get a history of injuries of the knee, but we have seen some evidence of minor injuries to the cartilage without incapacitation and with healing by scar tissue. Always this scar tissue is in the vascular area. We have never seen healing in the avascular or free margin. Again this is logical and gives a clue as to prognosis. If no formation of scar tissue occurs, because of lack of blood supply, then when the fracture trespasses on the avascular area it is predestined to nonunion. Similarly, fractures in the vascular portion, if they are sufficiently immobilized to allow scarring, will heal. Exactly 45 per cent of the injuries occur in the avascular area. Exactly 55 per cent occur in the vascular area. Fifty-five per cent will heal if there is sufficient post-traumatic fixation, confirming the fact that some are predestined

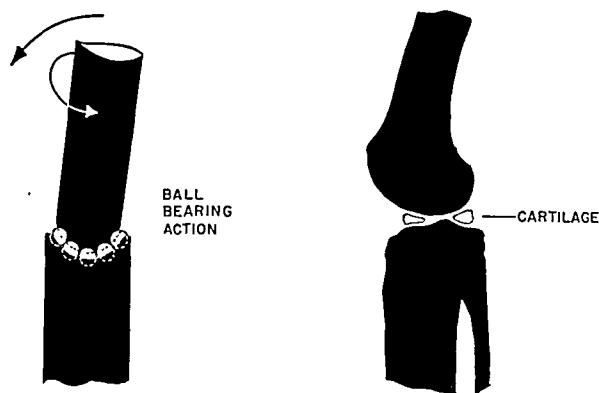


Fig. 4.—Ball bearing action of the cartilage in rotary motion of the knee joint.

to nonunion. Externally it is impossible to determine the exact location of the tear, and therefore it is impossible to give an exact prognosis.

Much confusion has surrounded the symptoms of injury to the cartilage. In the acute phase pain is present in 100 per cent of cases. With each recurring dislocation or fracture the pain is lessened and the period of disability is diminished. From the histories of many patients we have found that the first attack usually disables the patient for about two weeks. The second attack, which usually results from less trauma, lasts about six days. In cases of old injury the patient often displaces the cartilage with almost no abuse and his disability may be only momentary. Pain in the knee is present in 100 per cent. If it were not present the patient would not come to a physician, and, therefore, there may be some cases of injury to the cartilage without pain in the knee. Instability, "a feeling that the knee will give way," is present in 90 per cent of cases. There is swelling of the knee in 85 per cent of cases. At first this swelling is due to serous effusions and usually is transient. Later, synovial thickening occurs and swelling is persistent. Forty-five per cent of patients have pain when the leg is rotated on the flexed femur. Thirty-three per cent have tenderness exactly over the joint line. Locking occurs in only 30 per cent. This confirms the statement made previously

that only 30 per cent of lesions of the cartilage were such as to allow the interposition of the cartilage or part of the cartilage between the tibia and the femur in a manner to limit or preclude motion. Fifteen per cent of patients have pain on lateral motion. In only

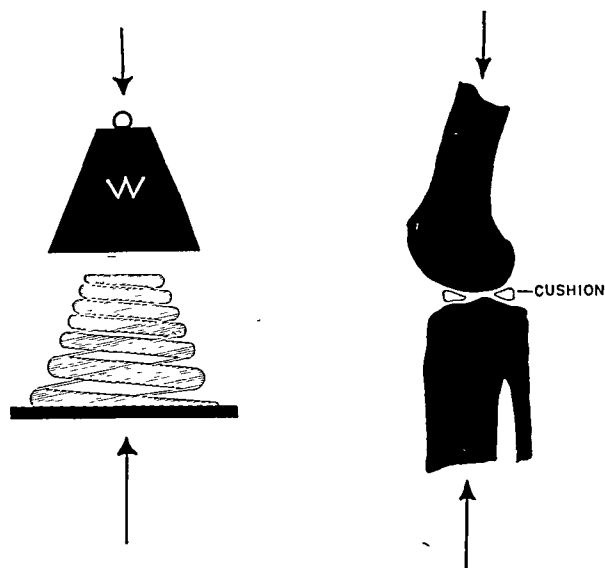


Fig. 5.—Cushion-like action of the cartilage.

2 per cent have we found a palpable mass. In short, the most unreliable symptom is locking of the knee joint. If one waits for this symptom one will miss 70 per cent of injuries of the cartilage. To reiterate, pain and instability, with intermittent swelling, are the most significant symptoms in the patient's history. Pain on flexion and rotation, tenderness over the joint line and limitation of motion are the significant physical signs. These are practically diagnostic. We have heard that roentgen data are valuable. They have not been, as yet, to us. Recently, workers at the Harper Hospital, Detroit (Reynolds and his associates), have developed a method of roentgenographing the abducted, extended, internally rotated leg. We have used this method, but not often enough to formulate any convictions.

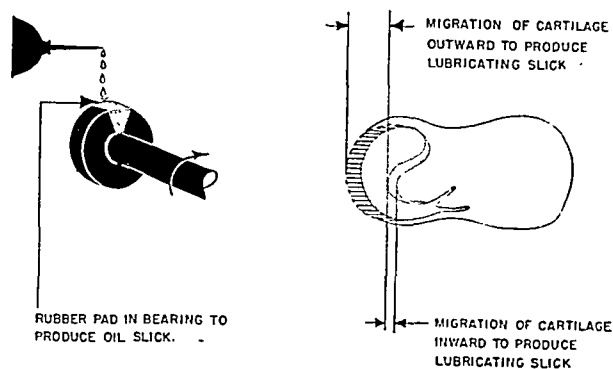


Fig. 6.—Migration of the cartilage to leave a lubricating slick of synovial fluid.

The findings of different observers vary with different types of practice. From the study of 1,700 cases (our own and cases from the literature) we have arrived at the following figures, which may be clinically significant.

The average age of all patients in this study was 29.85 years. The median age was 29. The average age of male patients was 30.48. The average age of female patients was 29.2. Eighty-six per cent of the injuries occurred in men and boys and 14 per cent in women and girls.

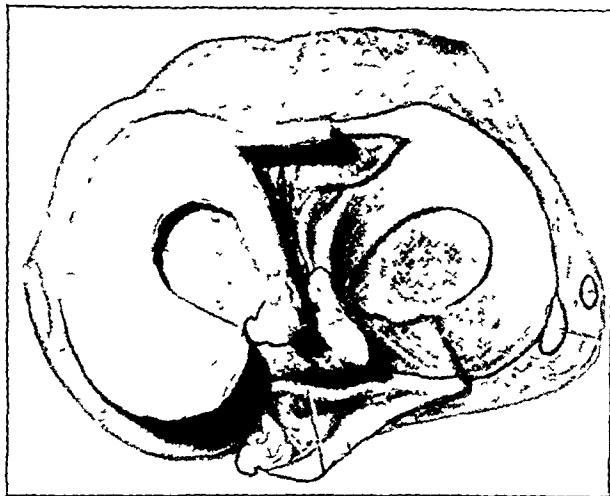


Fig 7—Tear through the anterior crucial ligament attachment of the internal semilunar cartilage (This and other models are in "plasticine")

It is interesting to note that 63.8 per cent of all patients who were weighed were overweight according to the weight tables of the Metropolitan Life Insurance Company. Eight and six-tenths per cent were of normal weight. The average degree of underweight for all ages was only 4 per cent. It is fairly conclusive, therefore, that the majority of patients were overweight and that those underweight were only slightly below the average. In the age group between 11 and 20, 92 per cent were overweight. Of those aged from 21 to 30, 60 per cent were overweight. Among those aged from 31 to 50, weights were about average.

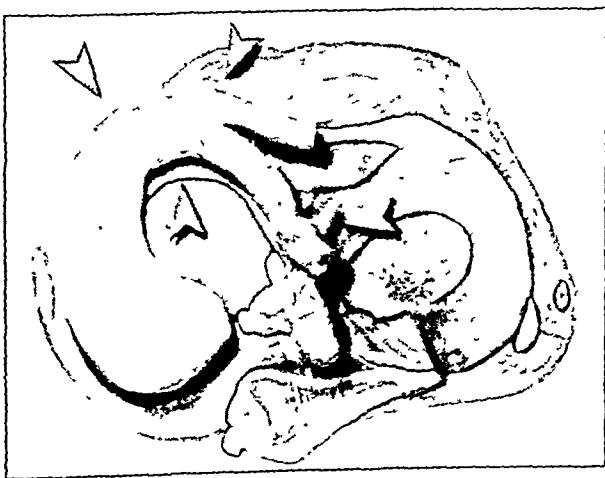


Fig 8—Tear through the anterior crucial ligament attachment, with forward dislocation of the cartilage

The question of activity is pertinent. We find that from the ages of 11 to 20 the activities of patients with injury to the cartilage are only moderate. From the ages of 21 to 50 occupations are more sedentary than is usual in this age period. These facts cannot be taken too seriously, since a person's avocation may differ

widely from his vocation. There are shreds of evidence to show that the sedentary person in poor physical condition is more liable to injuries of the cartilage than is the well muscled athlete.

As we progressed in our investigation it seemed to us that the injuries occurred more commonly in a certain body type. It seemed that a person whose bicristal diameter was broad in relation to his height was more liable to injury. This proportion was not always found, but it was found often enough to raise a suspicion. It would be logical to expect more push-pull injuries in persons with oblique femurs than in narrow-pelvised persons with vertical femurs. An index commonly used by anthropologists was employed in the study of 80 cases. The bicristal diameter was divided by the standing height and multiplied by 100. The index of the average injured patient was 158. The index of the normal person of the same age group was 154. This means, if it means anything at all, that injury to the cartilage occurs more commonly in the person whose pelvis is wide in relation to his body height. The most logical objection to this theory is the relative infre-

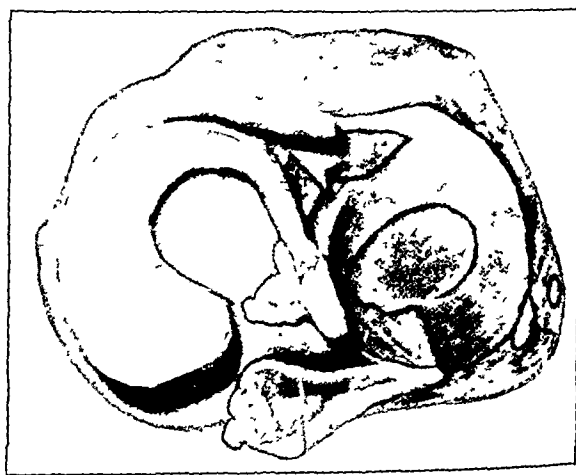


Fig 9—Longitudinal tear of the cartilage

quency of injuries in women and girls. We found that in a popular college of physical education injuries to the cartilage occur in nearly 50 per cent of the women students. This is a much higher ratio than is found for men of the same age group in schools devoted to physical education. Two conclusions are possible. One is that the wide-pelvised woman exposed to the hazards of sports is more prone to injury of the cartilage. The second is that the weaker musculature of the female makes her more vulnerable. We make no claim that a wide pelvis must inevitably accompany an injury to the cartilage. However, we think that it is one of the predisposing factors. When measurements have been taken in a sufficient number of cases we may be able to make this statement with confidence. In this paper we wish simply to raise the question to stimulate investigation.

An injury to the cartilage, therefore, seems most likely to happen to a man aged 29 years who is more sedentary than active and who is definitely overweight. His pelvis will be broader than is the average for his body height. There are certainly definite exceptions to this composite picture.

Concerning treatment, since 55 per cent of the fractures will lie in the vascular area, one can expect cure

by the formation of scar tissue in exactly that percentage. Forty-five per cent of the fractures will be in or pass through the avascular area. These are fore-ordained to nonunion and the production of continued disability. As stated previously, we cannot define the location of the fracture by external examination. We attempt it, but without confidence in our ability to do more than suspect it.

We have adopted, therefore, conservative treatment in all cases. There are two reasons. Fifty-five per cent of the injuries will heal. Furthermore, if a knee joint is opened during the acute phase immediately following fracture or dislocation, a severe serous effusion will occur. The knee joint opened many years after the first attack almost always escapes this effusion. There seems to be a tendency for the synovia to become less irritable after repeated trauma. To avoid the effusion and to give the body a fair chance to heal the injury, we put the leg, in slight flexion, in a plaster cast extending from the groin to the ankle. Reduction of the fracture-dislocation is always done with the patient under anesthesia by repeating the supination-flexion motions which allowed the injury. The patient wears the cast for six weeks. During the last two weeks

is dissected free. The cartilage is then removed through the anterior incision.

We like this method, since it permits removal with relatively little trauma to the articular cartilage. We have tried most other methods and have found that we often abuse the articular cartilage or fail to remove at

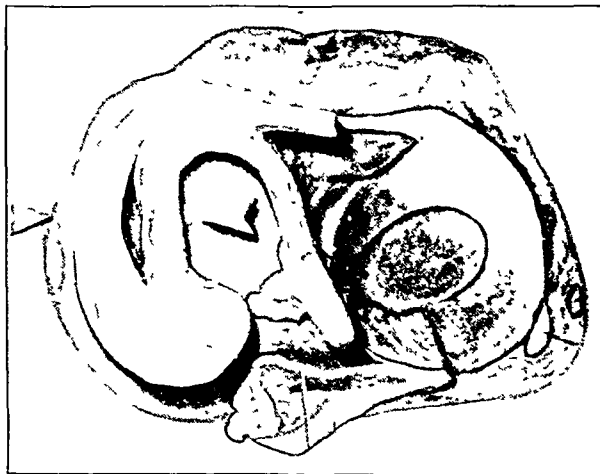


Fig. 11.—Bucket handle fracture

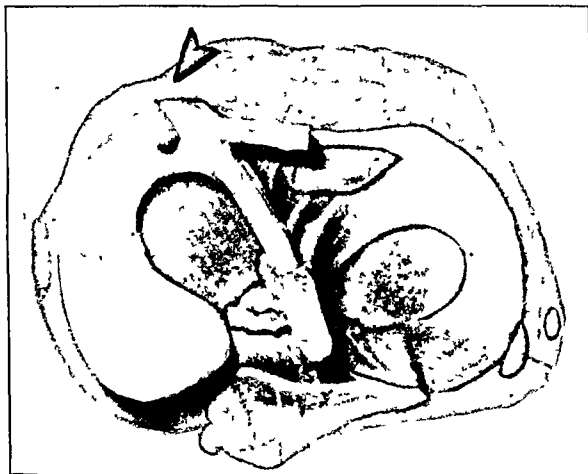


Fig. 10.—Chip fracture of the anterior portion of the cartilage

of this period exercises of the quadriceps are given to prevent the undue wasting which is so common. We know that no cartilage or knee ever recovers until the muscles of the thigh and the calf have been restored to their pristine condition.

At the end of six weeks the cast is removed and exercises continued. When there is much effusion an elastic bandage is used for two weeks.

Now the patient is either cured or not cured. Whether he is cured is determined by the location of the fracture. He is returned to work and is instructed to use the injured knee without restriction. If two attacks characteristic of injury to the cartilage follow his release from fixation, then he is advised that only operation will cure his knee.

Operation is done through the usual anterior incision, made long enough to allow good exploration of the knee. The front portion of the cartilage is cut free, and the attachment of the cartilage to the lateral ligament is separated as far back as can be done without excess trauma. A second incision is made just ahead of the hamstring tendons behind, and the posterior end

least 90 per cent of the cartilage. Two incisions take no longer to heal than does one.

We find that for patients under 35 no postoperative fixation is necessary. It has seemed desirable, however, to fix the knee in slight flexion for one week when the patient is over 35. Persistent effusion is common if this precaution is neglected.

Concerning results, as stated several times previously 55 per cent of our patients have recovered by fixation for six weeks. There may be some in this group who do not have injury of the cartilage. We have not opened the knee, and hence we do not know absolutely. Treatment of the remaining 45 per cent of injuries shows the following results: Complete cure is expected

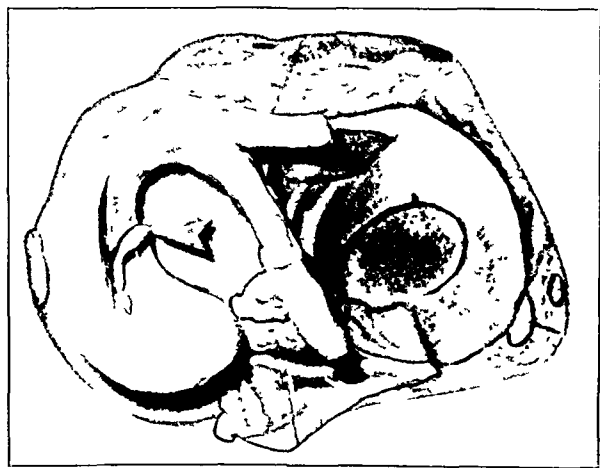


Fig. 12.—Compound bucket handle fracture This type traverses the avascular area to the free margin

in 72.33 per cent of cases. In 18.33 per cent there is slight pain, weakness, grating of the joint or occasional swelling of the joint. In 9.33 per cent there will be a recurrence of the intermittent pain, swelling, weakness, locking and loss of full motion of the joint.

The failure of treatment in 27.66 per cent of cases is attributed by us to the following causes, and in this order: (a) faulty diagnosis; (b) failure to recognize a concomitant injury of the anterior crucial ligament; (c) failure to remove the major portion or all of the

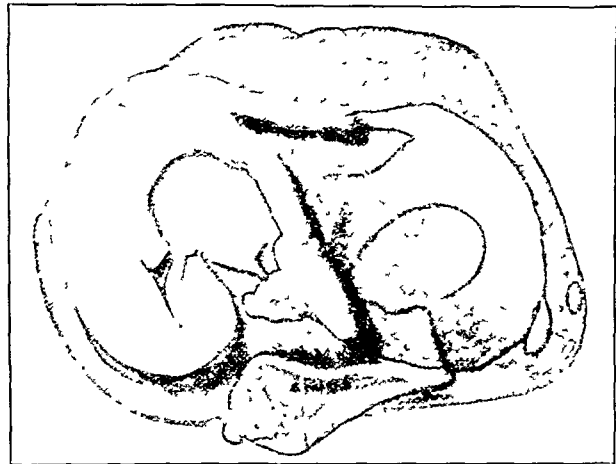


Fig 13—Tear into the posterior third of the cartilage

cartilage; (d) injury to the articular cartilage, pre-operative (cheilitis) or at operation; (e) damage to the internal lateral ligament; (f) persistent synovitis; (g) failure to operate within one year, and (h) regeneration of cartilage.

In this series the patient was usually operated on twenty-five and six-tenths weeks after his primary injury. The best results seem to have been obtained when operation was done between the fifth and the twenty-sixth week after primary injury. The worst results were in the cases in which operation was done fifty-three to two hundred and fifty weeks after injury.

Complete recovery was achieved twenty-one days after operation in the group between 11 and 20 years

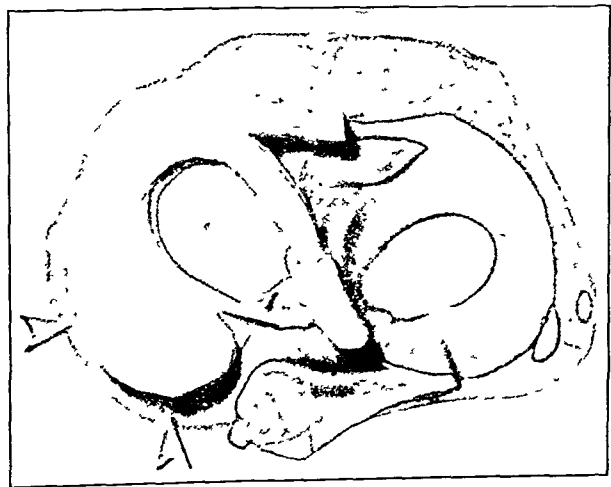


Fig 14—Dislocation of the posterior third of the cartilage

of age. In the group between 21 and 50 there was no great difference; the average recovery was within thirty-five days. With a few patients recovery took forty-two days or more, and a few of the last-named group recovered in twenty-eight days. We feel that the average patient injured in industry and protected by

compensation will be disabled from all work for forty-two days and from heavy work for two additional weeks. This is longer by 50 per cent than is required by the person who is treated as a private patient.

We cannot say definitely that to prevent injuries to the cartilage wide-pelvised men and boys should be kept from arduous activity. Perhaps we can in a few years, when this study has progressed further. Certainly, however, the poorly muscled, wide-pelvised, overweight male should be advised of his predisposition and, in industry, avoid as far as possible occupations which require frequent flexion and rotation of the knee. Exercises of the quadriceps given routinely in anticipation of injury seem, in certain football groups, to diminish the number of injuries to the internal cartilage. This is in keeping with our conclusion that the imperfectly muscled person is more likely to have such an injury.

CONCLUSIONS

- 1. Injuries to the cartilage occur most commonly at about the twenty-ninth year of life.
- 2. They are usually the result of intolerable torsion strains.

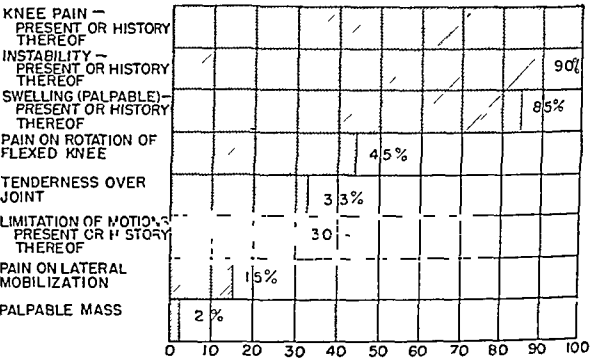


Fig 15—Relative incidence of symptoms of cartilage injury.

- 3. We believe that they occur most commonly in the obese, the undermuscled and the wide-pelvised person. These three factors may have the same basic cause.
- 4. The ordinary expectancy of results shows marked improvement in 90 per cent of cases in which operation is done. With the nonoperative methods 55 per cent of cures are expected.
- 5. Ordinarily, the younger the patient the quicker the recovery.
- 6. Patients operated on before the end of the sixth week after injury often have severe effusions. With the indecision which arises as to whether the lesion is through the vascular zone, and hence curable by conservative means, we believe that all patients should undergo six weeks' preliminary immobilization.
- 7. Injuries which recur after this period can be cured only by removal of the damaged cartilage.
- 8. Locking, despite the common belief, occurs in only 30 per cent of cases. Pain and instability are the most common symptoms.
- 9. Partial or complete failure of recovery after operation is due to many causes, chief of which is faulty diagnosis. Another important one is failure to operate before the end of the first year after trauma.

DIABETIC ACIDOSIS

A STUDY OF TWO HUNDRED AND TWENTY
CONSECUTIVE CASES

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Since the introduction of insulin physicians have been apt to feel that diabetic acidosis is a rare and unusual complication of diabetes and that it no longer presents a frequent medical problem. Unfortunately, this is not true. It still is of major importance and, as a careful study of the literature will reveal, still is responsible for a large number of fatalities which in most cases could be avoided if physicians and the laity were conscious of the incidence and the early symptoms. For this reason our paper is for the most part statistical.

Among the last 1,865 patients admitted to the metabolic services of one of us (Beardwood) at the Graduate Hospital of the University of Pennsylvania and at Bryn Mawr, Presbyterian and Abington hospitals, there were 220 with diabetic acidosis. We feel that the term diabetic coma is a poor one, as the coma merely is the terminal stage of an acidotic condition which has been present for one to three days. We feel also that the term coma is not descriptive of the actual chemical condition of the patient, for there were in our series some patients perfectly conscious whose blood plasma had a carbon dioxide-combining power of 7 volumes per cent and others, in deep coma, with a carbon dioxide-combining power of 33 volumes per cent. Therefore we feel that diabetic acidosis is the proper term to apply to the condition. One should disregard the term coma and realize that even before unconsciousness results the patient presents for some hours, or even days, symptoms of which earlier recognition will result in prompt treatment of the acidosis and therefore in a quicker recovery.

A brief review of the symptoms of diabetic acidosis would seem to be of interest. The usual symptoms are (1) increase of the cardinal diabetic symptoms of polyuria and polydipsia, (2) drowsy restlessness, (3) abdominal symptoms of nausea and vomiting and pain which may or may not be associated with tenderness, (4) coincidental development of Kussmaul breathing, (5) increasing drowsiness and (6) unconsciousness. It cannot be emphasized too strongly that these symptoms do not necessarily occur in this order and that coma may not develop even with a relatively low carbon dioxide-combining power. We feel that the abdominal symptoms are of primary importance in differential diagnosis. In a series which we reviewed previously,¹ 71 per cent of the patients showed as a predominating symptom nausea and vomiting; in this series of 220 patients 53.6 per cent had abdominal symptoms. The diagnosis of diabetic acidosis cannot be made with certainty from the clinical evidence alone but must be made from laboratory data.

1. Beardwood, J. T.: Abdominal Symptomatology of Diabetic Acidosis, *J. A. M. A.* 105: 1168-1172 (Oct. 12) 1935.

PRECIPITATING FACTORS

While every case of diabetes might be considered a potential case of acidosis, there seem to be certain definite factors which are given as precipitating causes. In table 1 are shown the precipitating factors as we could best obtain them from the histories. Joslin² expressed the belief that in his series the most common precipitating factor was dietary indiscretion, with infection next in importance. One patient in our series and 2 seen since it was completed have apparently been thrown into acidosis by the use of sulfanilamide for treatment of a concurrent infection. More than one fifth of this group, or 20.5 per cent, did not know that they had diabetes before they were admitted with acidosis; 28 were adults and 17 were children. In a good many of the 100 patients whose acidosis had no apparent precipitating factor the condition developed with nausea and vomiting which, as it cleared up when the acidosis was treated, would seem to have been a result of and not the cause of the acidosis.

TABLE 1.—*Precipitating Factors in Two Hundred and Twenty Cases**

1. No apparent cause.....	100
2. Infections of the upper respiratory tract (sore throats, etc.)....	38
3. Discontinuance of insulin.....	16
4. Onset of menstruation.....	13
5. Withdrawal of progynon-B therapy.....	1
6. Gangrene and vascular lesions of the lower extremities.....	10
7. Dietary indiscretions	9
8. Cerebral accidents	5
9. Pneumonia	5
10. Acute appendicitis	4
11. Pyelitis and urinary infections.....	3
12. Disease of the gallbladder.....	3
13. Ischiorectal abscess	2
14. Carbuncles	2
15. Congestive heart failure.....	2
16. Emotional upset (severe).....	2
17. Infection of the middle ear.....	1
18. Sulfanilamide in the treatment of infection of the middle ear....	1
19. Perineal abscess	1
20. Suicidal attempt with insulin.....	1
21. Cause unknown; patient referred to clinic; no symptoms.....	1

* Of the 220 patients, 118 (or 53.6 per cent) had abdominal symptoms. Of 20.5 per cent admitted without knowledge of their diabetes, 28 were adults and 17 children.

The principles, or aims, of the treatment of diabetic acidosis have been well stated by Darrow³ as (1) restoration of sodium chloride along with sufficient water to enable the kidneys to adjust extracellular volumes and concentrations, (2) adjustment of the acid-base equilibrium in certain cases and (3) treatment of the shock syndrome. The actual routine in the handling of the patient with diabetic acidosis requires the intelligent and judicious use of insulin, dextrose, salt and water. It would seem logical that in treatment of acidosis alkali should be added to the armamentarium. Sodium bicarbonate itself seems to have definite disadvantages, and we have recently been following the suggestion of Hartmann⁴ in using sixth-molar solution of sodium lactate. Hereafter sixth-molar solution of sodium lactate will be referred to as sodium lactate. Our series, however, contained some patients who were not treated with sodium lactate. With the use of this solution recovery from the acidosis is more rapid, and

2. Joslin, E. P., and others: Diabetic Coma, *Arch. Int. Med.* 59: 175-195 (Feb.) 1937.

3. Darrow, D. C.: The Pharmacopeia and the Physician: Treatment of Dehydration, Acidosis and Alkalosis, *J. A. M. A.* 114: 655-660 (Feb. 24) 1940.

4. Hartmann, A. F.: Treatment of Severe Diabetic Acidosis: Comparison of Methods, with Particular Reference to Use of Racemic Sodium Lactate, *Arch. Int. Med.* 56: 413-434 (Sept.) 1935.

we agree with Hartmann,⁴ who stated that almost as much benefit is derived from sodium lactate during the first hour of treatment as is accomplished in eight hours with the other routine procedures without the use of alkali. Chart 1 shows that a patient admitted twice in a diabetic coma, the states of acidosis being comparable,

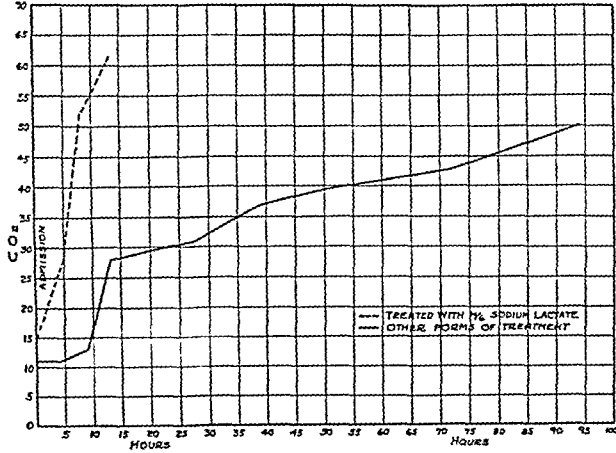


Chart 1—Comparison of treatment with sixth molar sodium lactate solution and other forms of treatment of the same patient during two successive diabetic comas.

recovered seventy hours sooner the second time, when sodium lactate was used. Hartmann advocated, particularly for diabetic children, a specified amount of sodium lactate, giving 60 cc. per kilogram of body weight. We have not followed his advice but have started patients under 15 with 500 cc. and given more when proper clinical response was not obtained. The adults we have given 1,000 cc. and increased this amount as the chemical response indicated.

It is interesting to note that, for children who received sodium lactate and recovered, the average time of recovery was eleven and one-half hours and the average amount of sodium lactate taken was 617 cc. For adults, the average time of recovery was twenty-one and six-tenths hours and the average amount of sodium lactate 1,114.6 cc. We have used sodium lactate in all cases of severe acidosis for the last two years. By recovery from acidosis, we mean the time required to bring the carbon dioxide-combining power of the blood plasma up to 45 volumes per cent.

INSULIN

The amount of insulin advocated in the treatment of diabetic acidosis varies considerably with different authors. We have tended to use smaller doses, possibly, than most other investigators. Our average dose of insulin has been for children 158.8 units and for adults 172.7 units, while for patients who did not recover the average dose was 160.8 units. We feel that with the use of sodium lactate smaller doses of insulin are required. Hartmann has shown that definite improvement can be obtained in cases of severe diabetic acidosis with sodium lactate alone. Recovery was slower than in cases in which insulin and sodium lactate had both been used.

MORTALITY

As we have stated previously, the prevalent thought is that diabetic acidosis is a condition which can be rapidly and easily controlled and for which the mortality rate should be low, but in twenty-five series from the literature reported by Bertram,⁵ the mortality rate

varied from 5.6 to 73.9 per cent, with an average of 29.1 per cent. In a careful survey, Dillon and Dyer⁶ showed a rate of 43.7 per cent. The deaths in our series of 220 cases totaled 52, making a rate of 23.6 per cent; autopsy was done in 20 cases. However, if we tabulate the deaths which we feel were due not to complications but to diabetic acidosis alone the rate becomes 5 per cent.

A great majority of our patients have had a carbon dioxide-combining power varying between 3 and 20 volumes per cent. We have included data on some with a combining power above 20 who presented clinical evidence of diabetic acidosis and ketonuria and recovered in the expected manner after the routine treatment for acidosis. We ruled out any other chemical or physical reasons for their acidosis.

FACTORS CONTRIBUTING TO MORTALITY

1. Age.—Our series bears out the observations on other reported series in that one of the most important factors contributing to the mortality was the age of the patient (chart 2). Among 80 patients with acidosis before the age of 20, 5 died. Of these 5, 2 died within four and one-half hours after admission to the hospital, a third died of severe acidosis following an attempt to commit suicide by taking large doses of insulin, a fourth died of influenzal pneumonitis and the fifth died with a pericardial effusion. The fifth patient might possibly be listed as having died of uncomplicated diabetic acidosis, because sufficient time had elapsed for treatment to be effective. In the age group from 20 to 30, 4 of 36

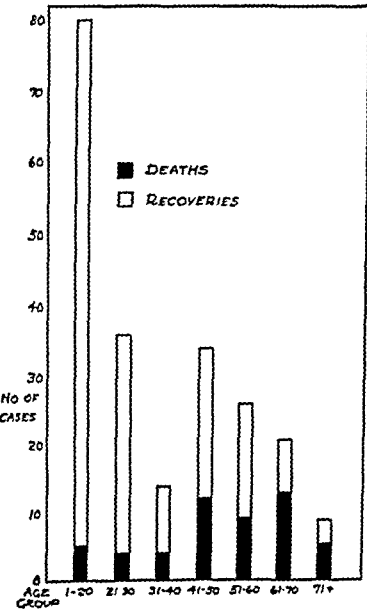


Chart 2.—Recoveries and deaths in various age groups in 220 cases.

patients died. The greatest mortality was in the age group from 60 to 70, in which 13 of 21 patients died.

2. Complications.—Of the 52 patients who died, 16 had cardiorenal complications such as coronary or cerebral thrombosis or uremia. Five had pneumonia, 4 died of surgical complications and 9 died of infections of various sorts. Eleven recovered chemically from their acidosis but later died. Even with autopsies, we were unable to determine a constant cause of death.

3. Renal Impairment.—Third in importance of the contributing factors was renal damage. A high level of urea nitrogen in the blood, while not always indicative of impairment of renal function, presented a bad prognostic sign in relation to recovery, as shown in table 2.

4. Degree of Unconsciousness.—The fourth factor was the degree of unconsciousness. While for the most

5. Bertram, F.: Pathogenese und Prognose des Coma diabeticum. Ergebn. d. inn. med. u. Kinderh. 42: 256-365, 1932.
6. Dillon, E. S., and Dyer, W. W.: Factors Influencing Prognosis in Diabetic Coma. Ann. Int. Med. 11: 602-617 (Oct.) 1937.

part unconsciousness is associated with a lowered carbon dioxide-combining power, as we have stated previously, the relation is not invariable. However, it seems logical to suppose that the unconscious patients are more severely acidotic than those who are conscious. As shown in table 3, of 220 patients 41.8 per cent were

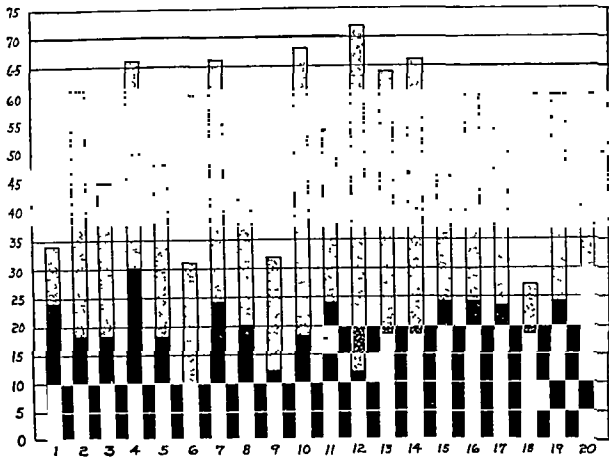


Chart 3.—Recovery times of one patient in twenty successive admissions for acidosis.

unconscious when admitted, and 29.3 per cent of these died. Of the 128 who were conscious, 19.5 per cent died. These figures are at slight variance with those of Dillon and Dyer,⁶ who found that 81 per cent of totally unconscious patients and 28 per cent of those who were conscious died.

5. *Severity of Acidosis.*—The fifth factor was the severity of acidosis, which is not, as we have emphasized, of necessity associated with the degree of consciousness. We have broken down the cases into groups according to the carbon dioxide-combining power of the patient on admission, CO₂ as shown in table 4.

TABLE 2.—Mortality Rate in Relation to Blood Urea Nitrogen

Blood Urea Nitrogen, Mg. per 100 Cc.	Recoveries	Deaths
1 - 20.	43	4
21 - 40	32	12
More than 40.....	9	11

TABLE 3.—Recoveries in Relation to Consciousness on Admission

	Recoveries	Deaths	Total	Death Rate, Percentage
Patient unconscious... ..	65	27	92	29.3
Patient conscious.....	103	25	128	19.5

6. *Recurring Attacks of Acidosis.*—This factor, which has been emphasized by other workers, we do not feel to be important in recovery from acidosis. In chart 3 it may be seen that 1 patient did not show much difference in recovery time as between the initial and the later of twenty successive admissions for acidosis.

ROUTINE OF TREATMENT

The following is a brief outline of our routine method of handling diabetic acidosis. It is important to emphasize that no hard and fast rule can be laid down.

Each patient needs an adjustment of the routine to fit his individual requirements. The treatment of acidosis naturally depends to a great extent on its severity. As a rule, in the case of severe acidosis our routine is as follows:

1. Immediately after admission blood is collected for determinations of sugar, carbon dioxide-combining power chloride and total base.

2. From 30 to 50 units of insulin is administered to the patient subcutaneously or, in exceptional cases, intravenously.

3. The administration of sixth-molar sodium lactate solution is started, the initial dose planned being 500 cc. for patients under 15 and 1,000 cc. for adults. This is given either by venoclysis or subcutaneously. Many patients require supplementary doses dependent on their chemical response.

4. If the initial reading of the blood sugar is below 250 mg., 25 Gm. of dextrose in 50 per cent solution is given intravenously at the same time.

5. In one hour, 15 to 25 units of insulin is given, with 25 Gm. of dextrose in 50 per cent solution. This is repeated every one or two hours, the dextrose being injected intravenously or administered through a Jutte tube until the patient's condition has improved by clinical and laboratory standards.

TABLE 4.—Mortality Rate in Relation to Carbon Dioxide Combining Power on Admission

	Number of Cases	Recoveries	Deaths	Mortality Rate, Percent- age	Average Carbon Dioxide- Combining Power on Admission, Volumes per Cent	Deaths Due to Com- plica- tions	Deaths Due to Dia- betes	Mortality Rate for Diabetes, Percentage
1-10	19	8	11	58.0	8.0	7	4	36.8
11-19	88	70	18	20.5	14.7	12	6	33.3
20 or over	102	81	21	20.6	30.3	20	1	5.0

6. Many patients with severe coma will require also 1,000 to 3,000 cc. of physiologic solution of sodium chloride, which may be given subcutaneously or by vein, depending on the individual patient. We have found it helpful to patients with poor veins and, particularly, to young patients to introduce a Jutte tube through the nose, allowing it to pass into the duodenum. This enables one to administer dextrose and fluids in a satisfactory manner and will save veins which may be sorely needed at a later date.

7. We have found that in cases of severe hypochloremia the administration of 50 cc. of a 10 per cent solution of sodium chloride is of help in restoring the depleted electrolytes.

8. Determinations of blood sugar and carbon dioxide-combining power are made every two or three hours until the patient is definitely free of acidosis. If such determinations are not possible, urinalysis may be made for the presence of sugar, acetone and diacetic acid. If urinalysis is used as an indication of therapy, we feel it is important in the absence of blood sugar determination to allow some glycosuria to occur to obviate the possibility of the patient's passing from acidotic coma into hypoglycemic coma without regaining consciousness.

SUMMARY

The mortality rate for 220 cases of diabetic acidosis among 1,865 diabetic patients was 23.6 per cent when cases in which there were complications were included; when such cases were eliminated it was 5 per cent. We feel that it is important in appraising any statistics on diabetic acidosis to take into consideration such complications, which would probably prove fatal even without the acidosis. We used sixth-molar sodium lactate solution in the majority of the cases and feel that it presents the following advantages: (1) quicker recovery chemically and clinically, (2) requirement of smaller amounts of insulin, (3) less tendency for complications and (4) not much danger of alkalosis. Such danger from treatment with sodium lactate has been over-emphasized, as some of our patients have gone into alkalosis with a carbon dioxide-combining power as high as 89, have been readily controlled and have shown no ill effects. Alkalosis occurs less frequently if the intake of sodium chloride is adequate.

While we have not emphasized in this paper the prevention of diabetic acidosis, we feel that proper education of the patient with diabetes in the prevention of acidosis is of greatest value in avoiding its development.

Diabetic acidosis is still a major medical problem requiring careful cooperation with the laboratory and energetic and intelligent treatment.

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Clinical Notes, Suggestions and New Instruments

ACUTE HEMOLYTIC ANEMIA FOLLOWING SULFATHIAZOLE ADMINISTRATION

REPORT OF A CASE WITH RECOVERY

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Acute hemolytic anemias following administration of sulfanilamide and sulfapyridine have been reported. Sulfathiazole, which appears to cause fewer toxic manifestations, has rapidly come into use for this reason and because it is effective against a wider variety of organisms than the former chemicals. Its potential dangers are evidently the same as the earlier drugs of the sulfonamide series. We have been unable to find reports in the literature of cases of acute hemolytic anemias caused by this drug and therefore wish to report the following case:

REPORT OF CASE

History.—A youth aged 19, a carpenter, had three teeth extracted in January 1941 and apparently made an uneventful recovery. Three weeks prior to admission to the hospital on April 26 a painless swelling of the right mandible developed. This gradually became larger and he consulted his dentist, who took roentgenograms that revealed a localized osteomyelitis at the site of the dental extraction. He then consulted a physician who directed him to apply hot packs and to take 10 grains (0.65 Gm.) of sulfathiazole every four hours. After he had taken 70 grains (4.55 Gm.) he noticed the appearance of jaundice. He was directed to discontinue the drug, but a temperature of 104 F. developed and he became severely ill.

The past history and family history were noncontributory.

Physical Examination.—On admission April 26 the patient appeared gravely ill. There was pronounced pallor of the skin and the scleras were jaundiced. His temperature was 102 F.,

the pulse rate was 160 beats a minute, respirations were 32 a minute and the blood pressure was 150 systolic and 0 diastolic expressed in millimeters of mercury. Examination of the right mandible revealed a soft, nontender mass 3 by 1.5 cm. which was not apparently connected with the bone, lying midway between the symphysis and the angle. There were no necrotic lesions of the mouth or throat. The lungs were normal on physical examination. The heart tones were weak with a systolic murmur heard over the entire precordium. The liver was tender and extended 3 or 4 cm. below the right costal margin. The spleen was not felt, nor were there significantly enlarged lymph nodes.

Laboratory examination on admission revealed 840,000 erythrocytes and 14,000 leukocytes per cubic millimeter of blood, with a differential count of 82 per cent segmented forms and 18 per cent lymphocytes. There was advanced hypochromasia, poikilocytosis and anisocytosis of the red blood cells. The blood group was II (Moss). The icteric index was 16.5 units. The reaction to the Kahn test for syphilis was negative. Urinalysis revealed a specific gravity of 1.028, a trace of albumin and a trace of sugar. Tests for bile and urobilinogen gave negative results. Microscopically there were occasional red and white blood cells per high power field (centrifuged).

Clinical Course.—From the time of admission to the twelfth day the patient had an extremely stormy course; he appeared moribund much of the time. On the sixth day bronchopneumonia developed and at the same time the blood pressure became 280 mm. of mercury systolic and 0 diastolic. The nonprotein nitrogen was 160 mg. and the creatinine 3.7 mg. per hundred cubic centimeters of blood. Throughout the illness there was a daily excretion of from 1,500 to 2,000 cc. of urine of low specific gravity. At no time did the urine contain more than a few red blood cells per high power microscopic field, nor were there abnormal amounts of urobilinogen.

The accompanying table reveals the tendency for the destruction of erythrocytes to continue despite the frequent transfusions of citrated blood; by the fourth day the red blood cells numbered only 940,000 per cubic millimeter of blood.

On the ninth hospital day a purpuric rash appeared over the entire body. A tourniquet test gave positive results. On the eleventh day the nonprotein nitrogen became 300 mg. per hundred cubic centimeters. Several tests for occult blood in the feces gave negative results. Three blood cultures were done, two of which were negative and one which contained a few colonies of nonhemolytic staphylococci was regarded as contaminated.

On the twelfth hospital day the mandibular swelling had gone. This lesion had never assumed importance in the illness and roentgenograms showed only a slight rarefaction at the site of the dental extraction. From this day on the erythrocyte count increased in response to transfusions and a steady improvement in the patient's condition occurred. His blood pressure at this time had dropped to 134 systolic and 72 diastolic. On the nineteenth day the phenolsulfonphthalein test of renal function yielded 55 per cent recovery of the dye in the urine in one hour and 72 per cent in two hours. On the twenty-second day the nonprotein nitrogen of the blood had dropped to 35.5 mg. per hundred cubic centimeters of blood.

On the thirty-eighth day after admission the patient was well enough to leave the hospital. At this time the urine contained a few hyaline casts and an occasional white blood cell per high power field. The erythrocytes numbered 3,690,000, the leukocytes 7,200 per cubic millimeter and the hemoglobin content was 11 Gm. per hundred cubic centimeters (68 per cent).

A check-up three weeks later revealed that the patient felt well but was still weak. The erythrocytes numbered 5,120,000 per cubic millimeter and the hemoglobin was 93 per cent. The nonprotein nitrogen was 35.3 mg. per hundred cubic centimeters and the phenolsulfonphthalein test of renal function revealed 45 per cent recovery of the dye in one hour and 66 per cent in two hours.

Clinical Course

Date	Blood Counts	Blood and Other Chemical Examinations	Urinalysis
4/26/41	Red blood cells..... 840,000 White blood cells..... 14,000 Hemoglobin..... 23% Differential Polymorphonuclears..... 82% Lymphocytes..... 18%	Icteric index, 16.5 units.....	Specific gravity, 1.028; albumin, trace; sugar, trace; bile and urobilin, negative; occasional white blood cells and red blood cells per high power field centrifuged
4/27/41	Red blood cells..... 1,340,000 White blood cells..... 21,200 Hemoglobin..... 31% Differential Polymorphonuclears..... 68% Lymphocytes..... 32%		As above
4/28/41	Red blood cells..... 1,490,000 White blood cells..... 14,350 Hemoglobin..... 34% Reticulocytes..... 22%	Icteric index, 14 units	
4/29/41	Red blood cells..... 960,000 White blood cells..... 14,350 26% 6 min. 16 min.		Essentially as above
4/30/41	Red blood cells..... 800,000 Hemoglobin..... 22%	Blood culture negative	
5/ 1/41	Red blood cells..... 980,000 White blood cells..... 26,000 Hemoglobin..... 24% Differential Polymorphonuclears..... 75% Lymphocytes..... 21% Monocytes..... 4% Nucleated red blood cells 34 per 100 white blood cells	Nonprotein nitrogen, 160 mg. per cent; creatinine, 3.7 mg. per cent; icteric index, 14 units; sulfathiazole blood level, 0	Essentially as above
5/ 2/41	Red blood cells..... 1,000,000 White blood cells..... 22,750 Hemoglobin..... 27% Differential Polymorphonuclears..... 68% Lymphocytes..... 32%		Specific gravity, 1.002; albumin, 2 plus; sugar, negative; occasional red blood cell and white blood cell
5/ 3/41	Red blood cells..... 1,410,000 White blood cells..... 28,600 Hemoglobin..... 30%		Specific gravity, 1.011; albumin, 2 plus; sugar, negative; occasional white blood cell and red blood cell
5/ 4/41	Red blood cells..... 1,550,000 White blood cells..... 20,000 30% 85% 15%		Specific gravity, 1.010; albumin, trace; occasional white blood cell and red blood cell
5/ 5/41	Red blood cells..... 1,760,000 Hemoglobin..... 40%	Icteric index, 10 units; nonprotein nitrogen, 300 mg. per cent; creatinine, 1.8 mg. per cent	Essentially as above
5/ 6/41	Red blood cells..... 1,810,000 White blood cells..... 7,100 Hemoglobin..... 39% Differential Polymorphonuclears..... 88% Lymphocytes..... 9% Monocytes..... 3%	Blood culture: nonhemolytic staphylococci (contaminant)	
5/ 7/41	Red blood cells..... 1,810,000 White blood cells..... 6,800 Hemoglobin..... 36%		Specific gravity, 1.008; albumin, trace; occasional white blood cell and red blood cell and hyaline casts
5/ 8/41	Red blood cells..... 1,810,000 White blood cells..... 6,800		Same as above
5/ 9/41	Red blood cells..... 1,760,000 White blood cells..... 6,900 Hemoglobin..... 40% Reticulocytes..... 2%		Specific gravity, 1.007; albumin, trace; 12 white blood cells, occasional red blood cells; numerous hyaline and granulated casts
5/10/41	Red blood cells..... 1,825,000 Hemoglobin..... 45%		As above
5/11/41	Red blood cells..... 2,120,000 Hemoglobin..... 40%		Specific gravity, 1.014; albumin, trace; 13 white blood cells per high power field; a few hyaline and granular casts
5/12/41	Red blood cells..... 2,150,000 White blood cells..... 7,200 46%	Icteric index, 10 units.....	Essentially as above
5/13/41	Hemoglobin..... 2,020,000 6,800 46% Differential Polymorphonuclears..... 73% Lymphocytes..... 20% Monocytes..... 7%	Blood culture negative.....	Essentially as above
5/14/41	Red blood cells..... 2,120,000 White blood cells..... 8,600 Hemoglobin..... 50%	Phenolsulfonphthalein: 1 hr. 55% 2 hrs. 22% Total..... 77%	Essentially as above
5/15/41	Red blood cells..... 2,280,000 White blood cells..... 10,700 Hemoglobin..... 59%		Specific gravity, 1.011; albumin, trace; 3-4 white blood cells and occasional red blood cells, and a few hyaline casts
5/19/41	Red blood cells..... 2,730,000 White blood cells..... 8,200 Hemoglobin..... 61%	Nonprotein nitrogen..... 35.5 mg. % Creatinine..... 3 mg. %	Specific gravity, 1.018; albumin, trace; moderate numbers of white blood cells and hyaline casts
6/ 2/41 dismissed from hospital 3 week check-up	Red blood cells..... 3,630,000 White blood cells..... 7,200 Hemoglobin..... 68% Red blood cells..... 5,120,000 Hemoglobin..... 93%	Phenolsulfonphthalein: 1 hr. 45% 2 hrs. 22% Total..... 67% Nonprotein nitrogen..... 35.3 mg. %	Specific gravity, 1.018; albumin, negative; sugar, negative; 2-3 white blood cells per high power field

Therapy.—On admission the patient was given 2,000 cc. of 10 per cent dextrose and 1,000 cc. of citrated blood from group II donors. This was followed by a chill and elevation of the temperature to 104.6 F.; his pulse became imperceptible and he became irrational. This condition persisted for a period of six hours before he improved and became rational. The next nine days he received daily transfusions of 500 cc. of citrated blood, all from group II donors. Thereafter he received transfusions on alternate days of 250 cc., likewise from group II donors, until he had received a total of 6,500 cc. of citrated blood. There were severe reactions to these transfusions until the procedure was preceded by infusions of sodium lactate-Ringer's solution in the amount of 30 cc., of the isotonic (one-sixth molar) solution per kilogram of body weight. This was begun on the tenth day and thereafter the patient improved uninterruptedly. Oxygen was administered intermittently by nasal tube from the fifth to the sixteenth day after admission.

COMMENT

In this case of acute hemolytic anemia which developed after the ingestion of 4.55 Gm. of sulfathiazole the anemia progressed and jaundice developed despite the prompt discontinuance of the drug by the patient's physician. As Koletsky¹ pointed out, the development of this condition does not depend on the dosage, the concentration of the drug in the blood or the type of infection but rather on the person's idiosyncrasy. Ravid and Chesner² reported a similar case resulting from the administration of 8 Gm. of sulfapyridine. There was likewise severe azotemia, but the urine contained large amounts of blood and at autopsy the renal tubules were filled with acid hematin casts. The authors likened the azotemia in their case to that which occurs in incompatible transfusions. The mechanism of the production of azotemia in our case is not clear to us. The creatinine remained almost normal while the non-protein nitrogen rose to 300 mg. per hundred cubic centimeters of blood. There was no hematuria nor did anuria develop. Sharpe and Davis³ noted that transfusions made attacks of hemolytic anemia worse by causing increased hemolysis. Our patient had severe reactions to transfusions, but there was no evidence that a hemolytic reaction occurred, as there was no hematuria and no increase of the icteric index after admission. Regardless of the mechanism involved, the reactions were prevented by alkalization of the urine, a therapeutic procedure whose importance Tragerman and Goto⁴ demonstrated in giving transfusions to patients with hemolytic anemia. Antopol and his co-workers⁵ described 2 cases of hemolytic anemia caused by sulfanilamide therapy in which autoagglutination of the patient's red blood cells was observed in the cold counting chamber. This phenomenon was not observed in our case.

CONCLUSIONS

1. A patient had a severe hemolytic anemia after the ingestion of 70 grains (4.55 Gm.) of sulfathiazole prescribed for a low grade osteomyelitis which followed a dental extraction.
2. A severe azotemia and hypertension developed, but there was no evidence of the occurrence of renal tubular obstruction with acid hematin casts, nor did anuria develop.
3. Recovery occurred after a prolonged stormy course. A total of 6,500 cc. of citrated blood was given in transfusions. Reactions to transfusion were prevented by infusions of sodium lactate-Ringer's solution.

3616 Main Street.

1. Koletsky, Simon: Fatal Hemolytic Anemia Following Administration of Sulfanilamide, *J. A. M. A.* **113**: 291-294 (July 22) 1939.

2. Ravid, J. M., and Chesner, Charles: A Fatal Case of Hemolytic Anemia and Nephrotic Uremia Following Sulfapyridine Administration, *Am. J. M. Sc.* **199**: 380 (March) 1940.

3. Sharpe, J. C., and Davis, H. H.: Severe Reactions Following Transfusion in Hemolytic Jaundice, *J. A. M. A.* **110**: 2053 (June 18) 1938.

4. Tragerman, L. J., and Goto, J. M.: Fatal Reactions to the Administration of the Sulfonamide Drugs, *J. Lab. & Clin. Med.* **25**: 1163 (Aug.) 1940.

5. Antopol, William; Appelbaum, Irving, and Goldman, Lester: Two Cases of Acute Hemolytic Anemia with Autoagglutination Following Sulfanilamide Therapy, *J. A. M. A.* **113**: 488 (Aug. 5) 1939.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
THEODORE G. KLUMPP, M.D., Secretary.

LABEL STATEMENTS OF
VITAMIN CONTENT

At the last meeting of the Council on Foods and Nutrition and the Council on Pharmacy and Chemistry it was decided in the respective councils that, when practicable, vitamin content should be stated in milligrams in preference to micrograms or units. This action was prompted by recognition that confusing practices have grown up in the industry concerning representations for the vitamin content of products. The vitamin content of food products has been expressed in micrograms even though the term is wholly unfamiliar to the public; as a result of this the purchaser may be led to believe that a product has a higher vitamin content when so represented than if units or milligrams were used. For instance, 1 mg. of vitamin B₁ equals 333 U. S. P. or international units, or 1,000 micrograms. A very similar situation prevails with respect to riboflavin. The conclusion was reached that, whenever it is possible and practicable, vitamin content should be expressed in milligrams. The decision is applicable to ascorbic acid, thiamine, riboflavin, nicotinic acid and vitamin K preparations and will be applied to other vitamins such as pyridoxine and pantothenic acid if any representations with respect to the quantities of these vitamins present are deemed to be in conformity with the policies of the respective councils. Vitamin A and vitamin D content should be expressed in U. S. P. units.

This ruling does not prohibit the use of U. S. P. units in conjunction with a statement of vitamin content in milligrams.

The ruling will be effective from the date of adoption of the report (May 21, 1941) for any product under consideration for acceptance. The effective date for products which have been accepted is April 1, 1942.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

THEODORE G. KLUMPP, M.D., Secretary.

REFINED SOLUTION LIVER EXTRACT PARENTERAL-LEDERLE.—A sterile, aqueous solution, containing the nitrogenous nonprotein fraction G of Cohn et al. obtained from fresh mammalian liver, preserved with 0.5 per cent phenol. The potency of the preparation is such that its daily parenteral administration has been found to produce the standard reticulocyte response defined for each U. S. P. unit (injectable) present when assayed in cases of pernicious anemia as required by the Council.

Actions and Uses.—Refined solution liver extract parenteral-Lederle is proposed for intramuscular injection in the treatment of pernicious anemia (see the general article Liver and Stomach Preparations, New and Nonofficial Remedies, 1941, p. 328).

Dosage.—To insure optimum dosage for cases of pernicious anemia in relapse it is advisable to make an initial injection of 30 to 40 U. S. P. injectable units (3 to 4 cc.) of 10 U. S. P. injectable units (1 cc.) each day for three or four successive days. About ten days subsequent to the initial treatment, weekly injections of 10 U. S. P. injectable units (1 cc.) are generally sufficient to induce complete remission. The maintenance dose should be not less than 1 U. S. P. injectable unit daily, but this may be given as a cumulative dose at intervals according to the discretion of the physician. In complicated cases and those with extensive neurologic involvement, the optimum dosage may be much larger and must be determined for each patient.

Manufactured by the Lederle Laboratories, Inc., Pearl River, N. Y.
Refined Solution Liver Extract Parenteral-Lederle, 10 U. S. P. Injectable Units Per cc., 5 cc. vials.
Refined Solution Liver Extract Parenteral-Lederle, 10 U. S. P. Injectable Units Per cc., 10 cc. vials.

Refined solution liver extract parenteral Lederle is prepared as follows. A mixture of finely ground liver and water is acidified to the isoelectric point, pH 5.054. After partial coagulation of the liver proteins is effected by heating to 75-85°C, the pulp is separated by filtration, centrifugation or pressing and the aqueous filtrate is concentrated in vacuo to the consistency of a thin syrup. By careful fractional precipitation with large volumes of alcohol at low temperatures (4°C) much inactive material (proteins) is precipitated and subsequently discarded. The alcoholic filtrate is concentrated in vacuo and sufficient alcohol added to precipitate the active material (fraction G) of Cohn et al. (Proceedings of the American Society of Biological Chemistry, *J. Biol. Chem.* 74:191x [July] 1927). The washed precipitate, generally known as "Cohn's fraction G," commonly obtained as a hygroscopic brownish powder, in addition to the active antianemic factor, contains much inert matter. In order to obtain a concentrate of the active factor as free as possible from inert substances, the solution containing the fraction G of Cohn is treated with a special activated carbon. After filtering off the carbon, the solution containing the active principle is concentrated in vacuo to a point where approximately 0.9 cc represents the active material obtained from 100 Gm of liver. Subsequently, sufficient phenol is added to make 0.5 per cent in the finished product, volume is adjusted and the solution is sterilized by Berkefeld filtration. The resultant product has a potency of 10 U S P injectable units per cubic centimeter.

POLLEN EXTRACTS-SQUIBB (See New and Non-official Remedies, 1941, p. 45).

The following additional pollen extracts-Squibb, marketed in 5 cc vials representing 10,000 protein nitrogen units per cubic centimeter, have been accepted:

Annual Blue Grass, Birch (Black, Gray and White Birch in equal parts), Burning Bush, Careless Weed, Dock (Bitter Dock and Yellow Dock in equal parts), Elm, Hickory (Black Hickory and White Hickory in equal parts), Lamb's Quarters, Maple Mixture (Red Maple, Silver Maple, and Ash Leaved Maple (Box Elder) in equal parts), Burrucc Marsh Elder, Pecan, Poplar (Downy Poplar and Lombard Poplar in equal parts), Redroot Pigweed, Sages (Sagebrush) Combined (Sagebrush, Pasture Sage, Prairie Sage and Coastal Sage in equal parts), Sheep Sorrel Spiny Amaranth, Western Water Hemp, Willow (Black Willow and Willow in equal parts), Wormwoods Combined (Wormwood, Biennial Wormwood, Dragon Sagewort and Mugwort in equal parts)

The following additional pollen extracts-Squibb are marketed in treatment set packages of three 35 cc. vials, representing, respectively, 100, 1,000 and 10,000 protein nitrogen units per cubic centimeter, in 5 cc and 20 cc. individual vial packages representing 10,000 protein nitrogen units per cubic centimeter and in 5 cc. and 20 cc. individual vial packages representing 25,000 protein nitrogen units per cubic centimeter

Grasses Northern Combined (June Grass, Red Top Sweet Vernal Grass, Orchard Grass and Timothy in equal parts), Grasses Southern Combined (June Grass, Red Top, Orchard Grass, Johnson Grass and Bermuda Grass in equal parts)

The following pollen extracts-Squibb are also supplied in 20 cc vials representing 10,000 protein nitrogen units per cubic centimeter and in 20 cc vials representing 25,000 protein nitrogen units per cubic centimeter:

Grasses Combined (Bermuda Grass, June Grass, Orchard Grass, Red Top and Timothy in equal parts), Ragweed Combined (Giant Ragweed and Dwarf Ragweed in equal parts)

The following pollen extract-Squibb is also supplied in 5 cc. vials representing 25,000 protein nitrogen units per cubic centimeter, in 20 cc. vials representing 10,000 protein nitrogen units per cubic centimeter, in 20 cc. vials representing 25,000 protein nitrogen units per cubic centimeter and in treatment set packages of three 35 cc. vials representing 100, 1,000 and 10,000 protein nitrogen units per cubic centimeter, respectively.

Ragweed and Cocklebur Combined (Giant Ragweed, Dwarf Ragweed and Cocklebur in equal parts)

RIBOFLAVIN (See New and Nonofficial Remedies, 1941, p. 553).

Riboflavin-SMACO.—A brand of riboflavin-N. N. R.

Manufactured by S M A Corporation, Chicago No U S patent or trademark.

Tablets Riboflavin SMACO, 1 mg
Ampules Riboflavin, 1 mg in 5 cc

SODIUM IODIDE (See New and Nonofficial Remedies, 1941, p. 299).

The following dosage forms have been accepted

Ampoules Sodium Iodide Endo, 10 Gm (15½ grains), 10 cc
Prepared by Endo Products, Inc., Richmond Hill, N. Y.
Ampoules Sodium Iodide Endo, 20 Gm (31 grains), 10 cc
Prepared by Endo Products, Inc., Richmond Hill, N. Y.
Ampoules Sodium Iodide Endo, 20 Gm (31 grains), 20 cc
Prepared by Endo Products, Inc., Richmond Hill, N. Y.

SULFATHIAZOLE (See New and Nonofficial Remedies, 1941, p. 514).

Sulfathiazole-Schiffelin.—A brand of sulfathiazole-N. N. R.

Manufactured by Schiffelin & Co., New York No U S patent or trademark.

Tablets Sulfathiazole Schiffelin, 0.5 Gm (7.7 grains)

ANTIPNEUMOCOCCIC SERUM, TYPE VII (FROM RABBITS) (See New and Nonofficial Remedies, 1941, p. 450).

E. R. Squibb & Sons, New York.

Antipneumococcic Rabbit Serum, Type VII—It is refined and concentrated by salting out with ammonium sulfate, the globulin fraction being retained. The final product contains merthiolate 1 in 10,000 and 0.2 per cent of phenol. Marketed in vials containing 20,000 units and 50,000 units each. Included in the trade package is a 5 cc vial containing 0.05 cc of the same concentrated rabbit serum diluted in 5 cc of physiological solution of sodium chloride for the sensitivity test.

ANTIPNEUMOCOCCIC SERUM, TYPE VIII (FROM RABBITS) (See New and Nonofficial Remedies, 1941, p. 451).

E. R. Squibb & Sons, New York.

Antipneumococcic Rabbit Serum, Type VIII—It is refined and concentrated by salting out with ammonium sulfate, the globulin fraction being retained. The final product contains merthiolate 1 in 10,000 and 0.2 per cent of phenol. Marketed in vials containing 20,000 units and 50,000 units each. Included in the trade package is a 5 cc vial containing 0.05 cc of the same concentrated rabbit serum diluted in 5 cc of physiological solution of sodium chloride for the sensitivity test.

ASCORBIC ACID-U. S. P. (See New and Nonofficial Remedies, 1941, p. 557).

The following dosage forms have been accepted:

Tablets Ascorbic Acid, 25 mg Each tablet contains 25 mg of ascorbic acid U S P, equivalent to 500 international units of vitamin C.
Prepared by Schiffelin & Co., New York.

Tablets Ascorbic Acid, 50 mg Each tablet contains 50 mg of ascorbic acid U S P, equivalent to 1,000 international units of vitamin C.
Prepared by Schiffelin & Co., New York.

Tablets Ascorbic Acid SMACO, 25 mg Each tablet contains 25 mg of ascorbic acid U S P, equivalent to 500 international units of vitamin C.

Prepared by the S M A Corporation, Chicago

MERCURIC OXYCYANIDE (See New and Nonofficial Remedies, 1941, p. 348).

The following dosage forms have been accepted:

Ampoules Solution Mercuric Oxycyanide, 8 mg in 5 cc Each 5 cc contains 0.008 Gm of mercuric oxycyanide N N R in distilled water.
Prepared by Endo Products, Inc., Richmond Hill, N. Y.

Ampoules Solution Mercuric Oxycyanide, 12 mg in 5 cc Each 5 cc contains 0.012 Gm of mercuric oxycyanide N N R in distilled water.
Prepared by Endo Products, Inc., Richmond Hill, N. Y.

SOLUTION OF POSTERIOR PITUITARY (See New and Nonofficial Remedies, 1941, p. 395).

SOLUTION OF POSTERIOR PITUITARY-ENDO—A brand of solution posterior pituitary-U. S. P.

Manufactured by Endo Products, Inc., Richmond Hill, N. Y.

Ampoules Solution of Posterior Pituitary Endo, ½ cc
Ampoules Solution of Posterior Pituitary Endo, 1 cc.

VIOSTEROL IN OIL (See New and Nonofficial Remedies, 1941, p. 559).

McKesson's Viosterol (A. R. P. I. Process) In Oil.—A brand of viosterol in oil-N. N. R.

Manufactured by the American Research Products, Inc., a subsidiary of General Mills, Inc., Minneapolis, under license agreement with E. I. du Pont de Nemours Company (McKesson & Robbins, Inc., distributors) U S patent 2,117,100 (May 10, 1938, expires 1953)

McKesson's viosterol (A. R. P. I. Process) in Oil is prepared by the activation of ergosterol by low velocity electrons. The activated ergosterol is refined and dissolved in vegetable oil. The final product is biologically assayed to contain not less than 10,000 units (U. S. P.) of vitamin D per gram.

GOLD SODIUM THIOSULFATE (See New and Nonofficial Remedies, 1941, p. 277).

Gold Sodium Thiosulfate-Lakeside.—A brand of sodium gold thiosulfate-N. N. R.

Manufactured by The Lakeside Laboratories, Inc., Milwaukee No U S patent or trademark.

Ampoules Gold Sodium Thiosulfate Lakeside, 0.01 Gm
Ampoules Gold Sodium Thiosulfate-Lakeside, 0.025 Gm
Ampoules Gold Sodium Thiosulfate Lakeside, 0.05 Gm
Ampoules Gold Sodium Thiosulfate Lakeside, 0.1 Gm

NICOTINIC ACID AMIDE (PYRIDINE: 3 CARBOXYLIC ACID AMIDE) SMACO (See New and Nonofficial Remedies, 1941, p. 556).

The following dosage forms have been accepted:

Ampoules Nicotinic Acid Amide SMACO, 50 mg per cc, 1 cc
Tablets Nicotinic Acid Amide SMACO, 50 mg

NICOTINIC ACID (See New and Nonofficial Remedies, 1941, p. 555).

The following dosage form has been accepted:

Tablets Nicotinic Acid, 50 mg Merrell
Prepared by the Wm S Merrell Co., Cincinnati.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 15, 1941

AMERICAN MEDICAL ASSOCIATION ANNUAL SESSION, ATLANTIC CITY, JUNE 1942

The Council on Scientific Assembly of the American Medical Association, under the chairmanship of Dr. James E. Paullin, is actively at work in cooperation with the secretaries of the various sections and with the Advisory Committee on the Pan American Session developing a program for the meeting in Atlantic City, June 8-12, 1942. Practically every problem of immediate concern to the medical profession is listed for discussion on some of the various programs of the annual session. New technics in the elaboration of scientific material are scheduled to be employed, including symposiums on chemotherapy, the vitamins, infantile paralysis and virus diseases. Round table or panel discussions, which were a most popular feature of the last annual session, are scheduled in several of the sections.

A significant feature of the annual session of 1942 is the all American character of the program. Correspondence is already under way to insure, if possible, the presence on the program of representatives from most of the South American countries, also from Central America, Canada, Cuba, Puerto Rico and other countries associated with the American continents. No doubt a considerable attendance of Latin American physicians will be insured by the presence in this country of many young Latin American physicians who are now in internships or residencies, as well as others who are pursuing graduate study in American medical institutions at this time. An entire session of the general scientific sessions is to be devoted to contributions by leaders in Latin American medicine. Moreover, the committee having charge of entertainment for the annual session proposes several features honoring the special guests of this occasion. As the program and other features of the meeting develop, announcements will be regularly made in the Organization Section of THE JOURNAL.

Unquestionably the attendance will be enhanced by the special features of the meeting already announced. Atlantic City is plentifully supplied with large hotels,

but accommodations in the board walk hotels, closely adjacent to the large auditorium, are soon exhausted by an attendance such as is anticipated. On the occasion when the American Medical Association met with the Canadian medical profession in 1935, almost 9,000 physicians registered. This means a sufficient number, together with the exhibitors and other guests, to tax the capacity of any convention city. A list of hotels will be published in THE JOURNAL in the near future, at which time members planning to attend should make reservations promptly.

AVAILABILITY OF CENSUS REPORTS

Recent inquiry at the Bureau of the Census, Department of Commerce, revealed a situation of importance to all who depend on the statistics and analyses based on the decennial census of the United States. The Bureau of the Census, from decades of experience in collecting and preparing data to meet the constantly increasing demand for authentic statistics, has endeavored to anticipate these needs by assembling more complete and comprehensive basic statistical information in each succeeding census. The 1940 decennial census has been completed. Those who depend on the census tables and analyses in their work await the census publications which they require. Vast amounts of newly gathered information now await the necessary processing by the Bureau of the Census before this information can be made available for general distribution. These data may have serious bearing on preparedness programs and projects.

Information from the Bureau of the Census indicates that many tabulations and analyses cannot be made available for distribution because of lack of funds. The number of items that have already been definitely eliminated from the population and housing program of the bureau include, among others:

1. Family statistics (including family income) for small areas.
2. Two basic tabulations relating to characteristics of in and out migrants for state subregions.
3. State of birth tabulations (these have been included in every census since 1850).
4. Detailed occupational statistics for cities of 25,000-100,000 inhabitants.
5. Statistics showing foreign born population by citizenship and country of birth.
6. Individual income statistics for small areas.
7. Labor force tabulations for states and cities of 100,000 or more inhabitants, including income employment status and other occupation and industry characteristics.

Additional items that must be eliminated if funds for the fiscal year 1943 are not obtained include:

1. Population and housing statistics for sixty tract cities.
2. All statistics relating to marital status, relationship and to education of persons under 25 years of age.
3. Statistics relating to mortgages and the financing of home ownership.

4. Statistics relating to wealth, public debt and taxation.
5. Critical appraisals and analytic materials essential to the interpretation of census statistics.
6. Census of defective, delinquent and dependent classes.

Other items which cannot be completed until a deficiency appropriation is obtained for 1942 include:

1. The complete tabulation of basic general population statistics for states and cities having 50,000 inhabitants or more, including marital status of the population, educational attainment of persons under 25 years of age in combination with school attendance, relationship of person to head of household, single years of age, age, sex and color of persons with unknown employment status, and citizenship in combination with age of foreign born population.

2. The basic and only tabulation contemplated for internal migration, showing the volume of in and out migration for selected areas and the characteristics of migrants. The loss of this tabulation will result in there being no statistics available for a considerable number of the inquiries included on the Population Schedule.

3. The complete tabulation of the industrial characteristics in the labor force, showing industrial affiliation in combination with such items as class of worker, broad occupational group, weeks worked during the year, age, color and hours of work.

4. Fertility statistics, planned on a sample basis, the transcription of data and card punching for which will be stopped when approximately half completed. The elimination of this tabulation will result in the loss of all data based on the questions relating to fertility on the Population Schedule.

5. Family statistics, planned on a sample basis, including family income data, the transcription and card punching for which will be stopped when approximately 60 per cent completed. The elimination of these tabulations will result in the loss of all statistics relating to the employment characteristics of families and of family income.

6. Joint population and housing household statistics, planned on a sample basis, the transcription of data and card punching for which will be stopped when approximately 70 per cent completed. The elimination of this tabulation will result in the loss of all data relating family income and other family characteristics to housing statistics.

7. The tabulation of housing characteristics in combination with type of structure.

8. The tabulation of housing characteristics in combination with contract or estimated rent.

9. The tabulation of housing characteristics in combination with gross rent, contract rent plus cost of utilities. The elimination of the tabulations in items 7, 8 and 9 will result in the complete loss of all cross classifications of housing census statistics.

10. Joint agriculture and population statistics, planned on a sample basis, that would provide wage and salary income of the farm family in relation to farm income, tenure, type of the farm, and so on, and social and economic characteristics of croppers and other tenure groups.

11. The tabulation of farm income by tenure, size of farm, and the like.

12. Completion of the transcription of farm data for minor civil divisions.

These statistical tables and analyses, basic data for which are now in the records of the Bureau of the Census, can be made available if additional funds needed for the completion of the work are provided to the bureau. The many agencies which utilize this material should do all they can to secure appropriation of the necessary funds.

CARDI-O-METER

Recently some sixty drug stores in the city of Chicago have added to their equipment a device called the Cardi-O-Meter, which enables any person who will put his arm in a strap and deposit ten cents in the slot to get a record of his blood pressure and of his pulse rate. This is not the first time that various schemes have been developed for measuring the blood pressure by nonmedical agents who collect a dime. The plan burst forth not long ago on Coney Island in New York and on the Boardwalk in Atlantic City. It was in effect in St. Petersburg, Fla., where many a middle aged westerner goes to keep warm in the winter. However, now the recording of blood pressure, it seems, is going to be wholly mechanical.

Americans are great believers in gadgets. The time may yet come when some ingenious mechanic, working in a machine shop, will promote a contraption designed to furnish a complete physical examination, including the basal metabolic rate, an electrocardiographic tracing, a vital capacity test with a spirometer, a muscle test with an ergograph, and the pulse and blood pressure recorded by the Cardi-O-Meter. All the former technics would be as meaningless and perhaps even less dangerous than uninformed attempts to interpret blood pressures. Indeed, just another step will carry the promoters to the provision of a complete x-ray picture of the chest and of the gastrointestinal tract following the dropping of some coins in slots. Brains, judgment and skill may then be relegated to the scrap heap of unessential accessories.

And if the druggists are going to put in the pulse and blood pressure equipment, there is no reason why pharmacy should not branch out into other branches of the practice of medicine. Instances have already been reported in which the corner drug store has been suggested as a suitable place for chemical tests of the urine and even for blood tests and hemoglobin determination.

Slot machines are nothing new in the drug business. You can gamble in a good many drug stores in the United States and shoot little balls at marks labeled from 50 to 5,000. Would it be surprising to see some one develop the use of the Cardi-O-Meter to the point where a blood pressure of 160 would get you \$1.20 in trade?

Regardless of the quality of the work done by the machine, the whole idea is unsound and psychologically dangerous to the human being. There are already too many blood pressure invalids created by present technics and writings without encouraging the recording of blood pressure by the "ten cents in the slot technic."

The promoters of the Cardi-O-Meter insist that the device was developed through consultation with "out-standing heart men of the city, including Dr. Nathan S. Davis, who was president of the Illinois Heart Association." Apparently, on the advice of Dr. Davis, according to the firm, they decided "we would not take

them higher than 200 in order not to frighten any one." Dr. Davis has stated, however, that they have no authority to use his name in the promotion of the device; certainly the Illinois Heart Association did not permit itself to be quoted in the promotion. Nevertheless drug clerks make the statement that the device has been approved by the Illinois Heart Association. If the pharmacists are sincere in their desire to advance the standards of their profession as one of the technics associated with the practice of medicine, they will not permit themselves to be drawn into the exploitation of this kind of dangerous mechanical medicine.

Current Comment

PROCUREMENT AND ASSIGNMENT SERVICE

The Procurement and Assignment Service for Physicians, Dentists and Veterinarians, established in the Office of Defense, Health and Welfare Services, held its first meeting in Washington on November 6. Subcommittees were established to consider the problems of medical, dental and veterinary schools, hospitals, industrial health, Negro physicians, public health and women physicians. A Committee on Information was established in order to keep the medical profession informed concerning developments and also to provide the public with the necessary facts regarding this service. The functions of the new service include procurement of personnel for emergency needs and the needs of medical service for civilian defense and other civilian needs. An office for such an agency will be established in Washington as part of the Defense, Health and Welfare Services, and regional offices will be set up in Chicago in the headquarters of the American Medical Association and of the American Dental Association. THE JOURNAL will make available shortly in its department devoted to Medical Preparedness a complete statement of the organization and personnel of the Procurement and Assignment Service.

EARLY RISING AFTER OPERATION

In a recent publication Leithauser and Bergo¹ have advocated early rising and ambulatory activity after operation. In a series of 370 cases in which an appendectomy was performed the average period of confinement to bed after operation was reported to be one and one-half days, and the average period of hospitalization after the operation was two and three-tenths days. After operation the patients were turned frequently in bed and were instructed to be active and to take deep breathing exercises at regular intervals. On the first postoperative day they were assisted in sitting on the edge of the bed and then in standing beside the bed

for deep breathing exercises. The great majority of patients were permitted to do light work on the eighth day and heavy manual labor on the fourteenth day. The method with slight modification was applied to the management of a series of 66 surgical cases of a more serious nature with the same gratifying results. There were no untoward effects from this management, and the morbidity, the number of complications and the period of disability have been materially reduced. Thus there were no pulmonary or vascular complications, no dehiscence, hernia, pneumonia, thrombophlebitis or other serious complications in the entire series of 436 cases. Analysis of the first series reveals that removal of the appendix through a McBurney incision was practiced in 108 cases of chronic appendicitis, in 153 of mild appendicitis, in 69 cases of acute appendicitis and in 40 cases of empyema or gangrene of the appendix without, however, rupture. Thus it may be stated that in 330 cases the operative intervention was a minor procedure and that in the more serious group of 40 cases without perforation the intervention could hardly be classed as major. While the nature of operative intervention in the second group (66 cases) was of the type generally referred to as major, the number is too small to permit the drawing of definite conclusions. This criticism does not imply that the principles advocated by the authors are either incorrect or revolutionary. The tendency in the management of operative cases has been for many years in that direction. The effect of the protracted recumbent posture on the pulmonary ventilation is well understood, especially since the clinical and experimental investigations by American surgeons of the subject of postoperative pulmonary collapse with its train of complications. The advocates of early rising point out the beneficial influence on the intestinal function and the function of micturition. Nor must one overlook the extremely important effect of early rising on the mental state of the patient. The type of management under discussion was first advocated by Emil Ries of Chicago as early as 1899. His patients were made to sit in a chair for ten minutes on the second postoperative day regardless of the extent of the intervention. He had adhered to this regimen throughout his surgical practice. The method was adopted somewhat later by H. M. Richter, also of Chicago, by the Mayos and by hosts of other American surgeons. The Germans usually credit Heinrich Braun with priority in this field. At the thirty-seventh congress of the German Surgical Society in 1908 Kümmel and Krönig spoke enthusiastically of the method. Early rising is interpreted somewhat differently by individual surgeons. Thus to Mermingas of Athens or to Kimbarovsky of Russia it means that patients operated on under local or spinal anesthesia walk to their room after having left the operating table; to others it means rising when the sutures are removed, on the fifth or sixth day. Generally early rising signifies that the patient gets out of bed on the second or third postoperative day. Obviously the method has its limitations as well as definite contraindications.

1. Leithauser, D. J., and Bergo, Howard L.: Early Rising and Ambulatory Activity After Operation: A Means of Preventing Complications. Arch. Surg. 42:1086 (June) 1941.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

RED CROSS BLOOD PROCUREMENT PROJECT FOR THE ARMY AND NAVY

WILLIAM DeKLEINE, M.D.
Washington, D. C.

The surgeon generals of the Army and Navy, recognizing the need for a large reservoir of blood plasma as a preparedness measure for a national emergency, requested the American Red Cross and the Division of Medical Sciences of the National Research Council to organize a cooperative blood collecting project. The request was presented in January of this year in identical letters addressed to the chairmen of the two agencies.

The Red Cross was asked "to secure volunteer donors in a number of the larger cities of this country, to provide the necessary equipment, to transport the drawn blood rapidly to a processing center, and to arrange for separating the plasma and for storing the resulting product in refrigerated rooms."

The medical division of the Research Council was asked "to assume the general supervision of the professional services involved in this collection and storage of plasma and to provide competent professional personnel, both for a national supervising group and for the local collecting agencies."

After some deliberation, the proposed project was approved by both agencies for immediate action. A collection unit was organized in New York City and the first blood drawn about February 1. A bleeding center was established at the Presbyterian Hospital, where a staff of physicians, nurses and other personnel was employed for this service. Similar collection centers have since been established in Philadelphia, Baltimore, Buffalo and Rochester. The blood is shipped at the close of each day's collection to the Sharp & Dohme Laboratories in Glenolden, Pa., which had previously been awarded a contract for processing the plasma.

The Army and Navy Blood Procurement Project is an outgrowth, in part at least, of a similar project in which a quantity of liquid plasma was collected for overseas shipment as a service to the British War Wounded.¹ The latter was instituted at the request of the British Red Cross following an urgent appeal from the British Ministry of Health.

After some deliberation as to the practicability of transporting unrefrigerated liquid plasma overseas, a collection program was inaugurated in New York with the cooperation of the Blood Transfusion Betterment Association of that city. This agency assumed the responsibility for all professional and technical services, including the collection of blood, separating the plasma, testing it for purity and finally releasing it for shipment. Collecting centers were opened in nine hospitals in New York and Brooklyn.

The American Red Cross with the cooperation of the New York chapter was responsible for securing the volunteer donors, safeguarding their interests and transporting the plasma overseas to the British Red Cross, which in turn released it to the British Ministry of Health.

The collections were begun in August 1940 and terminated Jan. 17, 1941. Seventeen thousand persons were enrolled and a total of fourteen thousand five hundred and fifty-six donor bleedings collected. Five thousand two hundred and seventy-two liters of liquid plasma, diluted 50 per cent with saline solution, has actually been sent to London. Refrigeration facilities were not available in transit. The last shipment was made June 30, 1941. Some of the material was held in storage for several months before it was finally released.

A number of workers have demonstrated that liquid plasma can be kept for a long time and stored without refrigeration. Elliott and his co-workers² state: "Plasma stored at room temperature for periods up to twenty-six months has been administered without reaction and with satisfactory results. Some of this plasma has been transported long distances." Newhouser and Kendrick³ say: "Properly prepared liquid plasma can be given safely after six months' storage without refrigeration. Dried plasma sealed under glass with a partial vacuum can be preserved for five years."

The experience gained in processing plasma on a mass production basis leads me to believe that liquid plasma is not satisfactory for military purposes. The principles and technic developed by highly skilled workers cannot always be observed in a project involving many collecting centers and a large number of technical personnel. The possibility of contamination and failure to detect it increases with each additional center and technical staff employed. This, coupled with lack of refrigeration facilities on navy ships and in military camps and a possible long period of storage clearly indicates the need for a more stable product which can be used safely under any and all conditions of military service.

Dried plasma meets these requirements far better than liquid plasma. If properly processed and hermetically sealed in vacuum glass containers, it comes nearest fulfilling present military needs. It is probably the safest approved transfusion medium now available on a mass production basis. It does not require refrigeration and can be kept indefinitely. Adding pyrogen-free distilled water quickly restores it to a liquid state ready for transfusion.⁴

The original request of the surgeon generals called for ten thousand units of dried plasma⁵—a unit being equivalent to 250 cc. of liquid plasma dried in the con-

2. Elliott, John; Tatum, Walter L., and Busby, G. F.: Blood Plasma, *Mil. Surgeon* 88: 118 (Feb.) 1941.

3. Newhouser, L. R., and Kendrick, D. B.: A Manual for the Preparation of Human Plasma, April 1941.

4. Strumia, M. M., and McGraw, J. J.: Frozen and Dried Plasma for Civil and Military Use, *J. A. M. A.* 116: 2378 (May 24) 1941.

5. Dried plasma is called lyophile by Sharp & Dohme.

1. Report of the Blood Transfusion Association Concerning the Project for Supplying Blood Plasma to England, Jan. 31, 1941.

tainer in which it is finally dispensed. This represents about the average amount of plasma recovered from one donor. The total number of units requested is therefore equivalent roughly to that many donor bleedings.

This quota has been more than completed. Fifteen thousand donor bleedings have been collected as of August 31, of which more than thirteen thousand units have actually been processed ready for transfusion.⁶ These are now being transferred to Navy ships where the emergency need appears to be the most urgent for the present. Some of the material will also be available for civilian catastrophes in which transfusions are necessary.

More recently the surgeon generals have asked that two hundred thousand units be processed within the next year, the final product to be equally distributed between the medical departments of the Army and Navy. This request has also been approved for immediate action. It calls for the rapid expansion of procurement centers in several of the larger cities of the country. The present rate of collection at the five centers mentioned is about one thousand bleedings a week. This rate will have to be quadrupled if the new quota is to be completed in the specified time.

Red Cross participation in the Army and Navy Blood Procurement Project is an outgrowth of many years of experience in organizing civilian blood donor projects. Several of these have been established in cities in the eastern part of the country. Donors are enrolled by Red Cross chapters and are subject to call in an emergency.⁷

In order to simplify control over all technical phases of this new project it was evident that uniform technics and methods of procedure would have to be adopted. It was therefore agreed that physicians, nurses and other personnel needed at bleeding and enrolment centers should be employed on a pay basis rather than serve as volunteers; that all donors should report at a single bleeding center in a given city rather than at several, as was done in the British Overseas Project; that uniform technics must be adopted and a standard bleeding bottle developed acceptable to the collecting as well as the processing agency. These and other regulations are necessary to insure a sterile and safe product.

Technics developed out of the experience of a single person or center are not necessarily applicable in a complex program of this character. Wide variations in quality of leadership and individual concepts of the collection problem, local customs and practices and other factors make it necessary that standardized technics and methods of procedure be followed.

The first bleeding center was established at a centrally located hospital. That seemed to be the logical place for such a project. It was found, however, that satisfactory space was not always available at hospitals. That led to a plan of equipping bleeding centers in some centrally located commercial building. This was first done in Philadelphia and later in Baltimore. It has some advantages in that enrolment and bleeding centers can be combined into a more unified and better functioning service. Donors seem to prefer to go to such a center rather than to a hospital. Baltimore has to date provided the largest proportionate number of donor bleedings in the period that this center has been in operation.

The division of responsibility between the participating agencies is well defined. The American Red Cross with the help of its chapters is responsible for securing the volunteer donors, providing the facilities and equipment necessary and shipping the collected blood to the processing center. The cost of all this, including the employment of the professional personnel, is assumed jointly by the national organization and its participating chapters.

The selection and direction of the professional personnel employed locally, development of technical routines and general supervision of the professional services are delegated to a special committee appointed by the medical division of the Research Council. This committee in turn selects a qualified physician in each procurement center to direct and supervise the work locally. The Research Council does not assume any financial obligations for the operation of the project.

The selection of biological firms and the awarding of contracts for processing plasma are cleared through the offices of the surgeon generals. They assume the cost of processing the plasma and preparing it for delivery in approved dispensing units.

If and when contracts are awarded, as is contemplated, to biological firms in different parts of the country, additional collecting centers will be opened in a number of large cities. These must of necessity be located within a radius of two or three hundred miles from the processing agency to insure delivery of the blood within twenty-four hours after it is collected.

Progressive steps in the procurement of donors and the collection of blood may be briefly summarized as follows:

Enrolment of donors and notifying them when and where to report.

Drawing the blood in containers with 50 cc. of citrate solution, provided and serviced by the processing agency.

Cooling the blood in these containers to about 4 or 5 C.

Packing and shipping the blood in precooled refrigerated boxes to the processing center at the close of each day's collection.

Progressive steps at the processing center are:⁸

Testing for syphilis. Positive bloods are discarded.

Centrifuging the blood in the bottle in which it is received.

Pooling the plasma from a number of bottles—twenty-five in actual practice.

Testing each pool for culture.

Placing 300 cc. of the citrated liquid plasma from the pool in individual dispensing bottles. This represents 250 cc. of actual plasma.

Freezing the plasma by immersing and rotating the bottles on an inclined plane "in a mixture of dry ice in a suitable freezing solvent." This deposits the frozen material on the inner walls of the containers—referred to as shelling. This facilitates the drying process.

Storing the plasma at -20 C. until ready for drying.

Drying the plasma in high vacuum while in the frozen state.

Sealing the bottle hermetically in partial vacuum.

The final product is a soft, flaky, cream colored powder containing less than 1 per cent moisture. Each dispensing bottle is separately packed in a firm carton, together with a 250 cc. bottle of pyrogen-free distilled water, tubing, filter, needles, and the like, completely equipped for giving a transfusion.

3000 Tilden Street.

6. Figures and data given apply as of Aug. 31, 1941.

7. DeKleine, William: Red Cross Blood Transfusion Projects, J. A. M. A. 111:2101 (Dec. 3) 1938.

8. Sharp & Dohme Seminar, vol. 3, No. 3, August 1941.

APPEAL TO CANADIAN PHYSICIANS FOR MEDICAL EQUIPMENT FOR BRITAIN

Through the Red Cross there has come to the Canadian Medical Association an appeal for used surgical and medical equipment to be sent across the water as soon as possible. Many large hospitals as well as many practitioners' offices throughout the British Isles have been bombed and destroyed. To care for the sick and wounded, great numbers of small hospitals have been established throughout the British Isles. Equipment for these hospitals is sorely needed, wherefore this appeal to Canada.

Every doctor has some piece of equipment which he can spare. If this equipment is not too far gone to be repaired, it can be used. The Canadian Red Cross will act as the receiving depot for all material and will put all equipment in perfect condition before it is shipped.

Under the chairmanship of Dr. E. A. McCulloch of Toronto, a medical committee has been set up which will examine every piece of equipment, classify it and recommend the necessary repairs. Physicians are requested to look over their stock of instruments and medical appliances now and see what can be spared. Everything from artery forceps to therapeutic lamps is required. Nothing is too small or too large. All parcels should be addressed to the Canadian Red Cross Society, 95 Wellesley Street, Toronto, Ontario, and labeled "Medical Equipment for Britain."

If any one knows of a doctor's estate or deceased colleague's equipment which is just lying dormant, it may be that the next of kin would feel happy in having this equipment used for the purpose that this appeal is intended to fill. Please act now.

TRAINING OF VOLUNTEER NURSES' AIDES

In a memorandum of September 2, the U. S. Director of Civilian Defense called on defense councils to collaborate with local Red Cross chapters and hospitals in a joint program for the training of 100,000 volunteer nurses' aides to meet the expanding needs of hospitals and health agencies during the national emergency. In order to provide adequate training so that the volunteer nurses' aides may be organized into a disciplined Civilian Defense Corps, the "Guide for the Training of Volunteer Nurses' Aides" provides that "the hospitals used as training centers should be on the approved list of the American Medical Association and the American College of Surgeons."

Copies of the "Syllabus" of the course, a "Guide for the Training of Volunteer Nurses' Aides" and a letter from U. S. Director F. H. LaGuardia, addressed to hospital executives and directors of schools of nursing, were sent to hospitals of one hundred or more beds which meet the aforementioned qualifications and have recognized nurses' training schools. A list of these hospitals is available on application to the medical division of your state defense council or to the regional medical officer in your civilian defense region. Hospitals wishing to participate in the volunteer nurses' aide training course must meet the standards prescribed by the Nurses' Aide Committee set up by the local Red Cross chapters.

Additional copies of the "Guide" and the "Syllabus" are also available from your Regional Civilian Defense Office or from your local Red Cross chapter.

MEDICAL SUPPLIES FOR NORTH AFRICA

Seventeen cases of supplies were shipped to the Free French forces in northern Africa by the Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York, recently, Mrs. Rogers Balcom, executive chairman, announced. This brings the total value of shipments thus far made to this group up to \$59,125.99. The latest consignment included, among other supplies, 1,174 instruments, 806 tins of canned food, 7,100 vitamin tablets and 13 gallons of liquid vitamins. Several crates of surgical instruments previously sent were acknowledged in a telegram from Emil Muselier, admiral of the Free French fleet, which stated: "The magnificent surgical material of which you have made a gift to our medical service has just reached us in excellent condition."

CIVILIAN DEFENSE WEEK

The Office of Civilian Defense, Washington, D. C., is recruiting volunteers to carry out protection against military danger and protection of the social structure of the community.

Thursday, November 13, of Civilian Defense Week was designated "Sign Up for Defense Day." In every city, town and village in which there is a local defense council—and in every one in which no council as yet has been established, it is expected there will be set up a Civilian Defense Volunteer Office, which is a community enterprise established, operated and directed by citizens of the local community to recruit men and women volunteers for civilian defense, to recommend them to local defense activities and to those community agencies in which their services are needed.

The functions of the Civilian Defense Volunteer Office are to discover and to promote opportunities for volunteers in local civilian protection programs, in the programs of federal and state agencies in the fields of health, family security, recreation, social protection, child welfare and education. It will find opportunities for individual volunteer service in the established public and private local community agencies as well as furnish information service to men in uniform, defense industry workers and their families; disseminate information on such programs as those of the USO and consumer groups, salvage programs, the sale of defense savings stamps and bonds, and various programs including forums, patriotic rallies, exhibits and adult education classes.

The Volunteer Office will serve as a clearing house for programs of training by finding out what training is needed, what is available, keeping up to date records of available courses and making arrangements for needed additional courses. It will coordinate the recruiting and enrolment of all men and women volunteers without supplanting the recruiting already being done by such agencies as the Red Cross and city departments, interview volunteers and refer them to training for jobs suited to their individual capabilities, and maintain standards of volunteer service in all the various local programs.

Development and extension of the Civilian Defense Volunteer Office program is under the immediate direction of Mrs. Eleanor Roosevelt, assistant director of the Office of Civilian Defense in Charge of Volunteer Participation.

ARMY FLIERS MAINTAIN LOW ACCIDENT RATES

Despite the increased amount of flying by the army air forces and the use of airplanes of much higher speeds than ever before, the accident rate in military flying during the last fiscal year has remained substantially unchanged, the War Department announced November 3. Although the number of miles flown by Army pilots and students has increased in almost astronomical proportions, the fatal accidents per mile flown continued practically unchanged in almost every phase of military aviation activity.

The accident rate in primary training during the last fiscal year was slightly below the average rate for the three year preemergency period. In the basic training stage the accident rate was below the 1937-38-39 mean and also below the 1940 rate, which was far below average. The advanced training stage accident rate also was well below the three year average but was slightly higher than the 1940 rate, which also was much below the average.

A slight increase has occurred in the accident rate for pilots who have gone into combat squadrons fresh from the flying schools. This increased rate has been lower than what was expected, since pilots with about two hundred hours of flying experience are flying fast, high performance warplanes. This slightly increased accident rate is expected to continue above the preemergency normal until the new pilots, as a body, increase their flying time and all round experience. For the older pilots, despite the faster airplanes and the increasing amount of flying under all sorts of weather on all types of missions, the accident rate is below the three year level.

Army flight operations now are on an emergency status. Safety, while still stressed as of major importance in connection with all types of operations, now must become secondary

to the carrying out of missions essential to the realistic training of combat pilots. This change has been accompanied actually by an overall decrease in the accident rate, a tribute to the caliber of the pilots being turned out by the Army Air Corps training schools.

THE CHEMICAL WARFARE SCHOOL

After the first World War, the Chemical Warfare School was transferred to Edgewood Arsenal, Edgewood, Md, where the general chemical warfare service center was located. Since the spring of 1921, classes have been given for the training of army, navy and marine personnel among a total of four thousand and forty-four students, about one hundred and fifty civilians, mostly from police and fire departments, have completed the course in civilian defense and are now being trained at the rate of fifty every two weeks. The school is organized in three general divisions: (1) instructional division, (2) supply and administration division, (3) extension course division. The faculty comprises about thirty officers and one hundred enlisted men who assist in conducting the many field exercises given in conjunction with the courses. It is intended that municipal officers who are trained here will in turn be responsible for the training of local defense units.

NATIONAL SURVEY OF REGISTERED NURSES

A survey of registered nurses has just been completed by Pearl McIver, senior public health nursing consultant, United States Public Health Service.¹ A total of 459,513 questionnaires were mailed out and approximately 75 per cent of these were returned. A total of 295,871 nurses residing in the state from which they reported completed the questionnaire. The information on these questionnaires is now being tabulated and placed on punch cards which will make it possible to sort out the names and addresses of young nurses who are eligible for military duty. It is estimated that the entire tabulation will not be complete for at least three or four months after the completion of this first report.

AVIATION MEDICAL EXAMINERS

Another routine course of instruction to qualify medical officers for duty as aviation medical examiners began October 1 at the School of Aviation Medicine, Randolph Field, Texas, and will continue for three months. The names of the officers enrolled in the class, together with the stations to which they are assigned, follow:

ADAIR, Samuel L, 1st Lieut, Brooks Field, Texas
ALLEN, Roy J, 1st Lieut, Fort Douglas, Utah
AMATO, Romelo J, 1st Lieut, Fort Jackson, S C
ANDERSON, Charles A, 1st Lieut, 13th Bombardment Group, Orlando, Fla
ANDERSON, Stanley B, 1st Lieut, Moffett Field, Calif
ARMSTRONG, James H, Captain, Camp Blanding, Fla
ASHLEY, Richard W, 1st Lieut, Brooks Field, Texas
BARNES, Russell H, 1st Lieut, Indiantown Gap, Pa
BARTON, Lewis W, 1st Lieut, Air Base, Manchester, N H
BEAVERS, Alonzo J, Jr, 1st Lieut, Air Base, Savannah, Ga
BENZON, George H, III, 1st Lieut, Fort George G Meade, Md
BLADES, James E, Captain, Fort Sam Houston, Texas
BOOTH, Edgar W, 1st Lieut, Maxwell Field, Ala
BOYD, Hamilton, Jr, 1st Lieut, Eglin Field, Fla
BRASLOW, Lawrence, 1st Lieut, March Field, Calif
BRENNAN, Andrew J, Captain, Fort Monroe, Va
BRONSON, William W, 1st Lieut, Randolph Field, Texas
BROTHERS, Ridgway H, 1st Lieut, Rankin School of Aeronautics, Tulare, Calif
BROWN, Frederic W, 1st Lieut, Kelly Field, Texas
BROWN, Kenneth L, 1st Lieut, Army Air Base, Baton Rouge, La
BUNTING, John J, 1st Lieut, Kees Field, Miss
BURNES, Sidney H, 1st Lieut, Air Base, Manchester, N H
CAMPBELL, Leland E, 1st Lieut, Ellington Field, Texas
CARLIN, George W, 1st Lieut, Palo Alto Airport, King City, Calif
CATINELL, Paul J, 1st Lieut, Gardner Field, Calif
CULBURN, Russell, Captain, Mitchell Field, N Y
CURRY, William H, 1st Lieut, Eighth Corps Area, Fort Sam Houston, Texas

DICK, Harry J, 1st Lieut, Hamilton Field, Calif
DONNELLY, Bernard A, 1st Lieut, Fort Douglas, Utah
ENGLEHART, Charles E, Captain, Fort Myer, Va
ERHARD, Elmo E, Captain, Fort George G Meade, Md
EUBANK, William R, 1st Lieut, Fort Leonard Wood, Mo
FAIR, George, Captain, Ellington Field, Texas
FISACKERLY, James S, Captain, Carlisle Barracks, Pa
FRY, Francis P, 1st Lieut, Fort Sam Houston, Texas
GAVIN, James F, 1st Lieut, Fort Bragg, N C
GONSER, Karl B, 1st Lieut (Oklahoma N G), Fort Sill, Okla
GRAMMER, James H, 1st Lieut, Camp Bowie, Texas
HARTLAND, William C, Captain, Chanute Field, Ill
HARWELL, Carl M, 1st Lieut, Georgia Aero Tech, Augusta, Ga
HEAVEY, John T, Captain, March Field, Calif
HOLMBERG, Robert E, 1st Lieut, Baer Field, Fort Wayne, Ind
HORTON, William H, 1st Lieut, Air Base, Hartford, Conn
HOTTINGER, Raymond C, 1st Lieut, Fort George Wright, Wash
HOWARD, Donald O, 1st Lieut, Randolph Field, Texas
HUTCHISON, William A, 1st Lieut, Selfridge Field, Mich
JAASTAD, Leonard B, 1st Lieut, Gunter Field, Ala
KENNEDY, Julien C, 1st Lieut, Bowman Field, Ky
KOS, Clair M, 1st Lieut, Randolph Field, Texas
KRAUSE, Charles D, 1st Lieut, Will Rogers Field, Okla
LIHN, Barney, 1st Lieut, Middletown Air Depot, Middletown, Pa
LONGWELL, Charles W, 1st Lieut, Air Corps Advanced Flying School, Phoenix, Ariz
LOTMAN, Harry A, 1st Lieut, Camp Shelby, Miss
LOWENSTEIN, Bernard, Captain, March Field, Calif
MCGREGOR, John T, 1st Lieut, Fort Lewis, Wash
NEILING, Richard L, 1st Lieut, Fort Jackson, S C
MELANCON, Joseph F, 1st Lieut, Scott Field, Ill
MEYER, Donald D, 1st Lieut, Air Corps Advanced Flying School, Phoenix, Ariz
MURRAY, E. Cotter, Captain, Recruiting Station, Lubbock, Texas
NOWACK, Louis W, Captain, Headquarters, 32d Infantry Division, Camp Livingston, La
OAKES, Alden B, 1st Lieut, Daniel Field, Ga
PENTECOST, Ben L, 1st Lieut, Camp Claiborne, La
PETERSON, Stanley C, 1st Lieut, Randolph Field, Texas
POPKIN, Roy J, Captain, McChord Field, Wash
POTTER, Floyd A, 1st Lieut, Lowry Field, Colo
RADCLIFFE, Ernest J, Captain, Air Base, Bangor, Maine
RAGSDALE, William E, Jr, 1st Lieut, MacDill Field, Fla
RANDOLPH, Angus C, 1st Lieut, Randolph Field, Texas
RECHLITZ, Ervin T, 1st Lieut, Fort Knox, Ky
REINER, Donald E, Captain, Fort Sam Houston, Texas
REINER, Ralph E, Captain, Carlisle Barracks, Pa
RILEY, Francis, 1st Lieut, Indiantown Gap Military Reservation, Pa
ROBBINS, Ben, 1st Lieut, Chanute Field, Ill
ROTHE, Courand N, 1st Lieut, Camp Bowie, Texas
SALMON, David D, 1st Lieut, Fort Sam Houston, Texas
SCHICK, William R, 1st Lieut, Army Air Base, Albuquerque, N M
SHEPPERD, Lewis A, 1st Lieut, Kelly Field, Texas
SHULLER, Thurman, 1st Lieut, Moffett Field, Calif
SPANGLER, Edward L, 1st Lieut, Fort Douglas, Utah
SPEAKER, Otho F, 1st Lieut, Fort MacArthur, Calif
STAAB, Frederick D, 1st Lieut, Eglin Field, Fla
STEVENS, Weir C, 1st Lieut, Hamilton Field, Calif
SWENSON, Orrin E, 1st Lieut, Selfridge Field, Mich
SWITZER, Ralph E, 1st Lieut, Fort Douglas, Utah
TABBAT, Samuel F, 1st Lieut, 49th Pursuit Group, West Palm Beach, Fla
TARRO, Harold I, 1st Lieut, Fourth Corps Area, Atlanta, Ga
THOMAS, George E, 1st Lieut, Camp Grant, Ill
UHRICH, John H, 1st Lieut, Douglas Field, N C
WELSH, John J, 1st Lieut, Basic Flying School, Cochran Field, Ga
WHITE, Thomas B, 1st Lieut, 4th Corps Area, Atlanta, Ga
WHITE, Thomas R, 1st Lieut, Army Air Base, Pendleton, Ore
WICKS, Ralph L, Captain, Fort Oglethorpe, Ga
WILCOX, Melvin R, Jr, 1st Lieut, Ellington Field, Texas
WILLIAMS, Claiborne, 1st Lieut, Alabama Institute of Aeronautics, Tuscaloosa, Ala
WILLIAMSON, Edwin M, Captain, Camp Wheeler, Ga
WEISMANN, Rodger E, 1st Lieut, Moffett Field, Calif
WOZENCRAFT, Jean P, 1st Lieut, Moffett Field, Calif
YOST, Ralph E, 1st Lieut, March Field, Calif
YOUNG, John D, 1st Lieut, MacDill Field, Fla

ACTING ASSISTANT SURGEONS APPOINTED IN THE NAVY

The Navy Department announced, September 28, that the following have been appointed acting assistant surgeons in the Navy with the rank of lieutenant (junior grade).

BASSHAM, Byron E, Chicago
ENNIS, Henry R, Rahway, N J
HAYLES, Alvin B, St Louis
JOHNSON, W. Hughes, Fountain City, Tenn
KING, E. Richard, West Liberty, Ohio
MULRY, William C, Emmetsburg, Iowa
RIORDAN, Emmett J, Seattle
VAIL, George A, Indianapolis
WILLIAMS, Orville K, Knoxville, Tenn

¹ Public Health Nursing 33: 472 (Aug) 1941. This appears also in the American Journal of Nursing, August 1941.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY

WAR DEPARTMENT

The following additional medical reserve officers have been ordered to extended active duty by the War Department, Washington, D. C.:

BIBB, Robert Chambers, 1st Lieut, Huntsville, Ala
BURTNICK, Lester Leon, 1st Lieut, Baltimore
CHING Marcus, Captain, Victorville, Calif
CONNER, Lyman Hugh 1st Lieut Burbank, Calif
GEWIRTZ, James Abraham, 1st Lieut, Brooklyn

HARTMAN, Charles Frederick, 1st Lieut, Reno, Nev
HEID, John Bernard, 1st Lieut, Turtle Creek, Pa
HUTCHINSON, John Joseph, 1st Lieut, New York
KAISER, Elias Noah, 1st Lieut, Montgomery, Ala
LEVINSON, Robert D, 1st Lieut, Brooklyn
LYNCH, Joseph P, 1st Lieut, Brookline, Mass
RESE, John D, 1st Lieut, Berkeley, Calif
ROGERS, Horatio, Lieut Col, Newton Centre, Mass
WETZEL, Earl Valentine, Jr, 1st Lieut, Little Falls, Minn

FIRST CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, First Corps Area, which comprises the states of Maine, Vermont, New Hampshire, Rhode Island, Massachusetts and Connecticut:

AIELLO, Louis James, 1st Lieut, New Haven, Conn, Fort Devens, Mass
BERKMAN, James I, 1st Lieut, Cambridge, Mass, Camp Lee, Va
BRIER, Hyman D, 1st Lieut, Bridgeport, Conn, Bangor Air Base, Maine
DOERNER, Alexander A, 1st Lieut, Chelsea, Mass, Camp Edwards, Mass
ELGOSIN, Emid D, 1st Lieut, Whitefield, N H, Camp Lee, Va

FELDERMAN, Jacob, 1st Lieut, Rutland Heights, Mass, Manchester Air Base, N H
GEER, George I, Jr, 1st Lieut, Portland, Maine, Camp Lee, Va
JADOSZ, Frank C J, 1st Lieut, Providence, R I, Bangor, Maine
PEARSON, Grosvenor B, 1st Lieut, Foxboro, Mass, Fort Devens, Mass
RAYMOND, William H, 1st Lieut, Lynn, Mass, Fort Williams, Maine
SODA, William E, 1st Lieut, Bridgeport, Conn, Camp Lee, Va
WIESNER, Ernest E, 1st Lieut, Brockton, Mass, Camp Edwards, Mass

Orders Revoked

CARIGNAN, Roland Z, 1st Lieut, Dover, N H
DUSTON, Charles H, 1st Lieut, Old Road Farm, Westford, Mass
HOWARD, Donald O, 1st Lieut, Boston
KEES, Philip A, Captain, Longmeadow, Mass
MCDONOUGH, Walter J, 1st Lieut, Dorchester, Mass

THIRD CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Third Corps Area, which comprises the states of Pennsylvania, Virginia, District of Columbia and Maryland:

BALDWIN, Thomas Marcy, 1st Lieut, New Brighton, Pa, Camp Lee, Va
BENNETT, Henry Garland, Jr, Captain, Baltimore, Camp Lee, Va
HAIMOWITZ, Samuel Isaac, 1st Lieut, Philadelphia, Camp Lee, Va
HEINIOFF, Leonard Lincoln, 1st Lieut, Baltimore, Fort George G Meade, Md
KEPECS, Joseph Goodman, 1st Lieut, Washington, D C, New Cumberland, Pa

LIGHT, John Jacob Bomberger, 1st Lieut, Lebanon, Pa, Indiantown Gap Military Reservation, Pa
SHOWERS, Joseph Franklin, 1st Lieut, Milton, Pa, Camp Polk, Va

Orders Revoked

DIXON, Charles W, Major, Export, Pa
GOLDSTONE, Herbert, 1st Lieut, Baltimore
HARRELL, Jerome B, 1st Lieut, Washington, D C
LUKAS, Alexander Benjamin, 1st Lieut, Shenandoah, Pa
RACHUNIS, Michael L, 1st Lieut, Glen Lyon, Pa
RUGH, Lloyd D, 1st Lieut, South Greensburg, Pa
SAYLOR, Lloyd E, 1st Lieut, Baltimore
TOSICK, William A, 1st Lieut, Cambridge, Md

FOURTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Fourth Corps Area, which comprises the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana:

BRADBURY, John William, 1st Lieut, Oteen, N C, Camp Gordon, Ga
BYRD, Charles William, 1st Lieut, Bunnlevel, N C, Camp Wheeler, Ga
CROOM, Arthur Bascom, 1st Lieut, Maxton, N C, Camp Wheeler, Ga
FOGEL, Morris, 1st Lieut, Biloxi, Miss, Camp Gordon, Ga
GARRETT, Brook Cleveland, Captain, Shreveport, La, Camp Claiborne, La
GROBMAN, Martin Edwin, 1st Lieut, Tuscaloosa, Ala, Camp Gordon, Ga

McBREARTY, John Dendy, 1st Lieut, Williamston, S C, Camp Wheeler, Ga
MURPHY, Frederick E, Jr, 1st Lieut, Jesup, Ga, Camp Wheeler, Ga
POWERS, Leander K, 1st Lieut, Guyton, Ga, Camp Wheeler, Ga
RICHARD, Dalbert J, 1st Lieut, Columbia, S C, Camp Gordon, Ga
TRYGGVI, Carl, 1st Lieut, Alexandria, La, Camp Gordon, Ga
WITHERINGTON, James B, 1st Lieut, Millington, Tenn, Camp Gordon, Ga

Orders Revoked

DINAN, Joseph Francis, 1st Lieut, Carville, La
JOHANSEN, Frederick A, Major, Carville, La
RICH, Maurice, 1st Lieut, Atlanta, Ga
STOKES, Lowell L, 1st Lieut, Lake City, Fla
WADLINGTON, James E, 1st Lieut, Florence, Miss
WILLIAMS, Lynwood Earl, 1st Lieut, Kinston, N C

CHANGES OF DUTY OF NAVAL MEDICAL OFFICERS

The Navy Department announced changes of duty involving the following officers:

BENNETT, John T, Captain, M C, U S Navy, from Naval Hospital, Pearl Harbor, T H, to Naval Hospital, Newport, R I
CARSON, Virgil H, Captain, U S Navy, from Naval Dispensary, Treasure Island, San Francisco, to Naval Hospital, Pearl Harbor, T H
CLIFTON, Alfred L, Captain, M C, U S Navy, from Naval Hospital, Puget Sound Navy Yard, Bremerton, Wash, to Naval Hospital, Mare Island, Calif

HOLEMAN, Charles J, Captain, M C, U S Navy, from Naval Hospital, Mare Island, Calif, to Thirteenth Naval District, Seattle
HOOKER, James F, Captain, M C, U S Navy, from Norfolk Naval Hospital, Portsmouth, Va, to Norfolk Navy Yard, Portsmouth, Va
HUNT, Daniel, Captain, M C, U S Navy, from Navy Yard, Washington, D C, to Naval Hospital, Puget Sound Navy Yard, Bremerton, Wash
O'MALLEY, John J, Captain, M C, U S Navy, from Norfolk Navy Yard, Portsmouth, Va, to Navy Yard, Washington, D C

ORDERED TO FOREIGN DUTY

BRUMBAUGH, Joseph John, Major, Canton, Ohio, Station Hospital, San Juan, Puerto Rico
LOMBARDI, Anthony Louis, 1st Lieut, Little Falls, N Y, Medical Detachment, 65th Infantry, Fort Buchanan, San Juan, Puerto Rico
HOOVER, Harold Roger, Lieut (j g) M C V (G), N R Pasadena, Calif, Naval Station, Guantanamo Bay, Cuba

NORTON, William Ignatius, 1st Lieut, Madison, Wis, Station Hospital, San Juan, Puerto Rico
REISHTLIN, William A, Lieut (j g), M C V (G), N R, Wilkes Barre, Pa, Naval Operating Base, Guantanamo Bay, Cuba

ORGANIZATION SECTION

THE ECONOMIC STATUS OF OBSTETRICS IN NORTH DAKOTA

P. W. FREISE, M.D.
BISMARCK, N. D.

Medical literature is relatively barren regarding economic factors. This barrenness, however, does not exist in lay periodicals. In contrast, such periodicals are rife, frequently in a derogatory manner, with articles dealing with the economic factors of medicine. This condition has probably always existed.

In late years the public, having been encouraged to demand the abundant life, expects the good care to which it is entitled, not fully realizing this improved care might entail some increase in cost. In 1817 the Boston Medical Association listed charges for midwifery during the day as \$12 and at night as \$15. In 1871 the Omaha-Douglas County Medical Society adopted a fee schedule which listed "obstetric fees, ordinary case of not over six hours \$20; for each hour's attendance over six hours \$1."¹ In interpreting these historical facts, one should keep in mind that undoubtedly the purchasing power of money at that time was at least 100 per cent greater than it is today. It can then readily be seen that the "high cost" of medical care, which supposedly exists today, was fully as high in the previous century. There is no record that state medicine was deemed necessary at that time, and yet at present, with better medical care and no great increase in fees, such interference seems imminent.

Recent years have brought about many changes in our economic structures. As a state we are not subject to industrial depression, strikes and the like, but climatic conditions have been such that agriculture has been relatively unproductive in North Dakota and some of the surrounding states. Consequently, poverty does exist to a considerable degree as a result of drought and climatic abnormalities.

Since ours is an agricultural state, the practitioner in North Dakota is dependent directly or indirectly on agriculture for a livelihood. We are not dealing with metropolitan patients but with an almost strictly rural clientele, the population of the largest city in the state being approximately 35,000. Thus it also becomes evident that the physician frequently needs to travel long distances to render care to his patients; his burden is physical as well as mental.

It should also be kept in mind that our state has few county or state institutions for the general care of the indigent. All hospitals, of course, are carrying on some charity work, but they are doing this without state or federal appropriations. As a result, practitioners in North Dakota are all private physicians who render services to the charity patient as well as to the private patient.

During this period of economic distress it has been felt that the general practitioner, as well as the few specialists in our state, was endeavoring to give the pregnant women good modern care regardless of remuneration. The federal government has spent large sums of money in North Dakota in the way of parity

payments, soil conservation payments and the like and the physicians have benefited indirectly from these. Many patients have been able to pay their doctor bills, which they could not have done without such assistance. It is impossible to estimate this factor of indirect relief, and in my analysis I shall deal only with the private patient and with the patient who is directly assisted by federal or state agencies.

An accusation which has been brought against the medical profession, and to which the public is inclined to give considerable credence, is the matter of fees, namely that the cost of having a baby is exorbitant and that the care is inadequate. The cost factor undoubtedly does vary in different localities and possibly varies with the prosperity of the client. Such discussions together with occasional press notices have stimulated efforts to determine how deficient the private practitioner is in rendering adequate obstetric care and whether he is financially willing and able to carry this physical and mental burden.

A subcommittee of the State Committee on Maternal and Child Welfare in North Dakota, in cooperation with the North Dakota State Board of Health, decided to send questionnaires to the physicians in the state. These questionnaires, based on data for the year 1939, were not sent out until the late spring of 1940 in order to allow a reasonable length of time for the patient to remunerate her physician. Undoubtedly many of them reached the wastepaper basket, since physicians are notoriously adverse to questionnaires and correspondence. However, the response was gratifying and much interesting information was obtained. These figures gathered throughout the state are not above suspicion of error, but it is believed that what errors may exist will, to some extent, counterbalance each other. The questionnaire submitted was as follows:

1. How many maternity cases did you care for in the year January 1, 1939 through December 31, 1939? (a) Private? (b) Other?
2. How many private patients paid for your services? (a) In full? (b) In part? (c) Nothing?
3. How many maternity cases were paid for out of public funds? (a) Amount per case? (b) Did this include prenatal and postnatal care? (c) If not, were you allowed payment for these services?
4. What are your charges for maternity care of the average private patient? (a) In the hospital? (b) At home? (c) Does this include mileage? (d) Do you make an additional charge for prenatal care? (e) If not, do you credit payments made at prenatal visits? (f) Do you make an additional charge for postpartum care?
5. What is the greatest distance you have gone from home this year to attend a maternity case?

Our analysis indicates that the largest fee received by any one physician for a private home case was \$50. The largest amount received by any one physician for a private hospital case, exclusive of cesarean section, was \$60. The greatest distance traveled by any one physician to attend a patient was 76 miles. It must be assumed that the fee for this was included in the total charge. The smallest fee collected was \$20. Consequently, it may be concluded that obstetric care is not excessive in cost, and for some families it represents a smaller item of expense than many luxuries, entertainment, refreshments and the like.

From the Department of Obstetrics, Quain and Ramstad Clinic.
Read before the Central Association of Obstetricians and Gynecologists at Indianapolis in October 1940.
1. Leland, R. G.: Medical Fees for Obstetric Service. J. A. M. A. 112: 1331-1333 (Sept. 30) 1939.

After familiarizing oneself with the foregoing facts, is one to assume that the physician, after rendering the service, is reimbursed with this nominal fee? The proportion of private patients who paid their bills completely was 50.5 per cent. Six physicians reported that none of their patients had paid in full. It can be seen from these facts that the physician is not the Shylock he is sometimes made out to be but is in most instances willing to render his service and "gamble" on being able to collect his fee. Were he of a strictly mercenary mind, he would demand payment in advance or refuse to care for the patient.

Of the remainder, it is found that 23.8 per cent paid their bills in part. What fraction of the bill was paid, I am unable to state. It is, of course, possible that after the questionnaire had been returned some of these bills were paid completely. There were 18.7 per cent of the patients who paid nothing, either because of financial inability or because of unwillingness. One can, of course, assume that some payment will still be made, but physicians have learned not to become too optimistic regarding this group.

Having considered the prosperous private patient, the one in moderate circumstances and finally the one who is in financial distress but not entitled to relief from public funds, I am now ready to consider the patient whose medical care was furnished by public funds. Each physician in 1939 was paid out of public funds for an average of 10 patients. The smallest fee from public funds was \$8.30; the largest fee received by any physician for a public patient, exclusive of cesarean section but embracing complications, was \$32.50; the average fee was \$16. In connection with these factors, twenty-nine physicians stated that they had had no public patients. Whether they were admirably located or they refused to accept this type of patient I am unable to say.

In a study of this kind one cannot neglect the so-called midwife even though she has no recognized status in our state. In using this term, I am referring to the attendant who performs the duties of a midwife, whether the person is a midwife, the mother-in-law, husband or other nonmedical person. There are a number of communities, even entire counties, without a physician. These areas are sparsely populated and some patients occasionally resort to the services of a midwife. Without adequate training, these services, of course, are meager and are rendered at a very nominal figure or even on a basis of barter.

During our economic distress has the midwife become more prominent? If so, would there be cause to say that the cost of medical care is exorbitant? In figures for the state, available back to the year 1924, I have chosen every fifth year to quote from. I find that in 1924 there were 14,539 births; 12,114 were attended by physicians and 2,425 were attended by midwives. In 1929 there were 14,722 births; of these 12,778 were attended by physicians and 1,944 were attended by midwives. In 1934 I find that the births were 14,613; there were 12,785 attended by physicians and 1,878 were attended by midwives. In 1939 there were 13,160 births; 12,364 were attended by physicians and 796 were attended by midwives.

Since 1924 the birth rate has dropped about 10 per cent but the number of births attended by midwives has dropped about 63 per cent. It can readily be assumed from these figures that the midwife is a decreasing menace at the present time, in spite of the previously mentioned accusation of the high cost of obstetric care. The maternal death rate in North Dakota for the year

1938 was 24 per 10,000 live births. The provisional figures of the Preliminary Report on Maternal Mortality for 1939 show that there were 30 deaths associated with diseases of pregnancy, childbirth and the puerperium. Some of the patients were not attended by a physician at the time of delivery.

Since it is our contention that the pregnant woman is receiving good care at a nominal figure, we need to consider the results of such care. In evaluating these, let us not assume too much credit for the low mortality rate. We are dealing with a fundamentally healthy class of people of good physique and stature. These people are of northern European extraction. They are living to a large extent as a rural population and have escaped some of the detrimental metropolitan hazards. I am referring to such conditions as contracted pelvis, rickets, tuberculosis and syphilis. The absence of Negroes with their high mortality is likewise a contributing factor. As proof of this it has been found that in our state and in surrounding states the incidence of cesarean section is lower than it is in areas where there is a Negro population.

The lowest maternal mortality rate in the nation in 1938 was established in North Dakota. The rate for 1939 is comparable, but the tabulations at this time are not complete. These figures defend us against any insinuation that the pregnant woman in our state, regardless of ability to pay, is not receiving good obstetric care. We have convinced ourselves that the exorbitant obstetric fees do not exist in our state and that the private practitioner is carrying his burden with little complaint. We need to maintain this standard and improve on it. Some of the deaths that occurred could have been avoided, and with better knowledge and standards of obstetric care the death rate in North Dakota will be appreciably lowered.

SUMMARY

1. North Dakota has few charity institutions for the care of the indigent.
2. Physicians in North Dakota have always cared for the charity patients and will continue to do so.
3. A survey based on a questionnaire sent to the physicians in the state has proved that the private practitioner is taking care of the obstetric patients regardless of remuneration. The survey showed that (a) 50.5 per cent paid the total bill; (b) 23.8 per cent paid the bill in part; (c) 18.7 per cent paid nothing; (d) highest fee for a home case was \$50 and for a hospital case \$60; (e) smallest private fee was \$20; (f) fees from governmental agencies: (1) smallest \$8.30, (2) largest \$32.50 and (3) average \$16.
4. The fees for obstetric care are not exorbitant. They have fluctuated very slightly, while medical care has shown considerable advancement.
5. It can be assumed that the care rendered to the patient is good, as demonstrated by the consistently low maternal mortality rate in North Dakota.

OFFICIAL NOTES

THE ATLANTIC CITY SESSION

Applications for Space in the Scientific Exhibit

Application blanks are now available for space in the Scientific Exhibit at the Atlantic City session, June 8 to 12, 1942. The Committee on Scientific Exhibit requires that all applicants use the regular form giving the title and brief description of the exhibit, the amount of space required, and so on. Blanks may be obtained from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

MEDICAL ECONOMIC ABSTRACTS

YOUTH COMMISSION ADVOCATES
HEALTH INSURANCE

The American Youth Commission, of which Mr. Owen D. Young is chairman, at a recent meeting in Washington, D. C., recommended the establishment of a system of health insurance and listed the following six specific points of which the commission thought the public health authorities would generally approve:

1. Any system of health insurance should include free choice of physician by the patient (subject, of course, to the consent of the physician).

2. Cash benefits, to cover a part of wages lost by employed persons, should be an integral and inseparable part of the system. Considering illness as a social problem and not merely as a medical one, it is as vital to provide shelter and food as it is to pay for the doctor and medicines.

3. The cost should be assessed and collected, as other social insurance costs are met, from the beneficiaries, from the employing industry and from the state.

4. The medical part of the administration should be conducted as far as possible by medical men, with only such oversight by them of the individual physician as universal experience has found necessary and acceptable.

5. Physicians should be paid from the insurance fund, either by separate fees for each service rendered or by an annual sum for each patient choosing that physician. While American physicians generally at present would prefer the fee system, the other system has been found more satisfactory in most countries.

6. The system should be obligatory for approximately the same group for which workmen's compensation is now compulsory.

NATIONAL PHYSICIANS' COMMITTEE
REPORTS

On October 17, the Management Committee of the board of trustees of the National Physicians' Committee met and authorized the mailing of a report on two years operations to all United States physicians.

On Oct. 14, 1939—two years ago—the first letters and literature were mailed to physicians. This agency, it is said, is evidence of the fact that, at an earlier date and to a greater extent than any other group in the United States, American medicine sensed and began to understand the need for and potential value of educational propaganda.

Three well defined tasks were undertaken:

1. Clarifying the basic issues to a point of understanding for and within the profession.

2. Promoting the extension of the distribution of high quality medical care.

3. Educating the public to a point of understanding on the basic meaning of and the effective results from our system of independent medical practice.

WIDESPREAD COOPERATION

The establishment of the National Physicians' Committee, supplementing the efforts of existing medical organizations, stimulated medical journals in almost every state to the publication of articles and editorial comment on or in connection with the importance and effectiveness of our system of distribution of medical service.

As a new agency it aided in creating widespread discussion of this vital issue within county and state medical society groups. These discussions led to a clarification and understanding of the issue and toward unifying the profession. They stimulated local medical societies to undertake the providing of medical care on a cooperative or a prepayment basis. More than two hundred of these plans have been undertaken, two of them—the California Medical Service and the Michigan Medical Service—on the basis of statewide operation under medical association sponsorship.

These efforts have been vitally important. They have provided medical care for many thousands of persons in the lower income groups. More important, they have provided conclusive evidence of the fact that the medical profession has been and is fully aware of and alive to its grave and exclusive responsibility; namely, the providing of the highest possible medical care to all the people at the lowest possible cost. Further, and of even greater value, the experimental efforts have demonstrated that there is no panacea for the problem of medical care. The two vital factors remain—the Doctor and the Patient.

Under the subtitle "Educational Efforts," statements are quoted by President Roosevelt; Mr. Arthur J. Altmeyer, chairman of the Social Security Board; Mr. Owen D. Young, chairman of the American Youth Commission of the American Council of Education, and Mr. Paul McNutt, Federal Social Security Administrator, and the following statement is made:

These statements of medical policy by the highest authorities provide a graphic and practical demonstration of the fact that medicine's fundamental concepts are beginning to be accepted as bases of operations. The President's rehabilitation program, through "local doctors," is a concrete example of their application.

The report continues:

Today, there is greater cause for fear and a greater need for constant and intelligent vigilance than at any previous time if the independence of medicine is to be preserved.

THE GREATEST DANGER

Today, in the United States, there are more people gainfully employed, at higher rates of pay, than at any previous time. These generally larger earnings are beginning to influence more prompt payment for medical care. Shortsighted physicians, freed from a part of the sense of financial insecurity, are prone to forget or to ignore the more important issues involved.

It is true that this lessening of unemployment has removed one of the basic cause factors which led to the determined drive for the state control of medical service. However, the new advocates of "state control" and new factors demanding greater centralization of governmental authority have actually increased the danger. It is possible that the solution of the problem of medical independence will necessitate approaching it from a broader base.

WOMAN'S AUXILIARY

Pennsylvania

The Chester County auxiliary met recently at the Pennsylvania Epileptic Home at Oakbourne, with Dr. Kenneth Scott as host. Miss Hetzel, who has charge of the occupational therapy department of the home, told of the weaving, wood-work, basketry and other arts taught the patients.

Wisconsin

Rock County auxiliary members were guests at the annual dinner of the medical society in Janesville, recently, attended by 72 members and guests. The necessity for acquainting the general public with facts on cancer prevention was emphasized

by the two speakers, Mrs. G. E. Stoddart, Beaver Dam, state commander of the Women's Field Army for Cancer Control, and Dr. W. D. Stovall, state chairman of the American Society for the Control of Cancer. Thirty nurses from Mercy Hospital attended the program. An afternoon meeting for the public was held at the Janesville High School.

The second new county auxiliary to be added to the Wisconsin membership in 1941 is that to the Barron-Sawyer-Washburn-Burnett County Medical Society. A meeting was held at Rice Lake, May 20, at which Mrs. Donne F. Gosin, president of the state auxiliary, and Mrs. E. S. Schmidt, state organization chairman, completed the organization.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Personal.—Dr. Wallace D. Hunt, Seattle, for six years health officer of King County, Washington, has been appointed senior surgeon in the U. S. Public Health Service and assigned to duty as regional medical officer of the Ninth Civilian Defense Area with headquarters in San Francisco.

Physicians Urged to File Birth Certificates.—Physicians in attendance on births are urged by the Los Angeles County Health Department to make certain that birth certificates are properly filed. According to the city department of health, a recent birth registration test conducted by the U. S. Bureau of the Census revealed the startling information that there were twenty-eight unregistered births within the jurisdiction of the Los Angeles County Health Department during the four months under study. Of this number fifteen were hospital births.

Latin American Students at University.—Two Latin American physicians are studying at the University of California Medical School, San Francisco, as a part of a plan to offer advanced training to medical graduates from Latin American countries. The physicians are Drs. Manuel de J. Castillo, who graduated at Central University of Honduras, and Dr. Juan Aycineno, a graduate of the University of Guatemala School of Medicine. The program to carry out this service for Latin American students is under the direction of an advisory committee composed of Dr. Howard C. Naffziger, professor of surgery; Frank Hinman, clinical professor of urology, and Ralph Soto-Hall, clinical instructor in orthopedic surgery. Dr. Soto-Hall is a native of Costa Rica.

ILLINOIS

Commission for Aid to Handicapped.—Four physicians were appointed members of the Illinois Commission for Handicapped Children by the governor, September 11. They are Drs. Frank A. Norris, Jacksonville; Edward L. Compere, Chicago; Henry B. Thomas, Chicago, and Bert I. Beverly, Chicago. A new act passed by the Sixty-Second General Assembly changed the form of the commission, which was created by an act approved in 1933. The amended act increases the commission's membership from five to nine and stipulates that its duties are to coordinate the administrative responsibility of the departments concerned with the welfare of handicapped children; to stimulate private and public efforts for the care, treatment, education and social service of handicapped children; to promote adequate provisions for medical diagnosis and treatment, and to promote vocation guidance training, placement and social adjustment of the handicapped. It will also be the commission's responsibility to study conditions relating to physically and mentally handicapped children in Illinois and other states with a view toward improving such facilities and services available to such children in Illinois. Other members of the commission are:

Mrs. Harry M. Mulberry, chairman of the legislative committee of the Parent-Teachers Association, chairman of the commission.

Henry C. Warner, Dixon, chairman of the Commission for Handicapped Children for several years.

Irving Pearson, Springfield, Ill., executive secretary of the Illinois Education Association.

Edward H. Stulken, principal of the Montefiore Special School for Delinquent and Problem Children, Chicago.

Robert Bell Browne, Ph.D., director of extension, University of Illinois, Urbana.

Chicago

British Psychiatrist to Lecture.—Dr. Robert D. Gillespie, London, England, psychiatric specialist of the British Royal Air Force, will address a joint meeting of the Chicago Neurological Society and the Illinois Psychiatric Society at Thorne Hall November 21. His subject will be "Psychoneuroses in Peace and War and the Future of Human Relationships."

Dr. Joseph Beck Honored.—Former students and colleagues of Dr. Joseph C. Beck, since 1932 associate professor of laryngology, rhinology and otology, emeritus, University of Illinois College of Medicine, gave a dinner in his honor September 26. Dr. Beck was presented with a statue of himself which recently won a prize at the exhibit of the American Physicians Art Association in Cleveland. The statue was the work of Dr. Adolph M. Brown.

Symposium on Shock.—The Chicago Medical Society devoted its meeting, November 12, to a symposium on shock; the following participated: Drs. Virgil H. Moon, professor of pathology, Jefferson Medical College, Philadelphia, as guest speaker, discussed "Vascular Dynamics of Shock: Practical Applications"; Warren H. Cole, "Prevention and Treatment of Surgical Shock"; Italo F. Volini, "Treatment of Peripheral Circulatory Failure" (medical shock), and Paul S. Rhoads, Evanston, Ill., "Shock in Allergic Conditions."

The Pasteur Lecture.—Dr. George H. Whipple, dean and professor of pathology, University of Rochester School of Medicine and Dentistry, Rochester, N. Y., will deliver the sixteenth Pasteur Lecture of the Institute of Medicine of Chicago at a joint meeting with the Illinois section of the Society for Experimental Biology and Medicine in the Palmer House, November 28. Dr. Whipple's subject will be "The Production, Utilization and Interrelation of Blood Proteins—Hemoglobin and Plasma Proteins."

KANSAS

Personal.—Dr. Thomas L. Foster has resigned as superintendent of the Osawatimie State Hospital, Osawatimie, to accept an appointment in the psychiatric department of the Hertzler Clinic, Halstead.—Dr. William R. Palmer, Kansas City, has been named coroner of Wyandotte County to succeed the late Dr. Lawrence E. Gowney.—Dr. Arthur J. Anderson has resigned after thirty-five years' service as school physician of Lawrence; he has been succeeded by Dr. Wray Enders of Lawrence.

Society News.—Dr. Henry N. Tihen, Wichita, will be the guest speaker at the fall dinner meeting of the Wyandotte County Medical Society, Kansas City, November 18; he will present a review of gastroenterology. The society was addressed at its meeting, November 4, by Drs. Eldon S. Miller, on "Interpretation of Abdominal Blood Chemistry" and Albert J. Rettenmaier, "Differential Diagnosis of the Acute Abdomen." Both are from Kansas City.—The Central Kansas Medical Society was addressed at its quarterly meeting in Russell, September 18, by Lieut. Col. Seth A. Hammel, Kansas National Guard, Topeka, and state medical director of selective service, on "Medical Aspects of the Draft"; Dr. Arthur D. Gray, Topeka, "New Development in Use of the Sulfonamides in Genitourinary Diseases," and Dr. Robert H. Riedel, Topeka, "The Public Health Aspects of Venereal Disease."—At a meeting of the Southeast Kansas Medical Society in Fredonia, recently, the speakers were Drs. Louie F. Barney, Kansas City, on "Modern Concept of Wounds and Their Treatment"; James B. Weaver, Kansas City, Mo., "Treatment of Osteomyelitis," and Lee H. Leger, Kansas City, "Use of Sulfonamide Drugs."—The Sumner County Medical Society devoted its September meeting in Wellington to a round table discussion of sulfonamide drugs.

MARYLAND

Newspaper Donates Space to Hospital.—The Easton Star-Democrat has donated space to the Emergency Hospital in Easton to be used as "a sounding board for the coming twelve months." The initial announcement, appearing in the issue of October 31, reads:

To you,

THE PUBLIC

Thanks to the generosity of the Star-Democrat and a couple of friends, this place has been donated to the hospital as a sounding board for the coming twelve months.

Here we shall briefly outline what we are trying to accomplish. And to show you how you can aid in that accomplishment.

For to be of maximum use to our community there must be a binding partnership between the hospital management and you, the public. The hospital is here to help you when you most need it—when illness strikes. When you are well and strong the hospital needs you to prepare it for that day you need it.

The hospital needs you when you can spare something. You need the hospital when you cannot.

It is our obligation to give you an efficient, well run institution at all times. It is your obligation to support us, to help us care for the unfortunate who require free treatment; to help us expand our facilities to meet the growing needs of our community.

Here we will tell you of some of our problems, some of our aspirations. Here we will set forth some of the things which we hope will bring a closer understanding between the two partners—the hospital and you, the public.

Let's work together.

THE EMERGENCY HOSPITAL.

NEVADA

State Medical Election.—Dr. John R. McDaniel Jr., Las Vegas, was chosen president-elect of the Nevada State Medical Association at its annual session in Elko in September and Dr. George R. Magee, Yerington, was installed as president. Dr. Horace J. Brown, Reno, is secretary of the association. The next annual meeting will be held in Reno, September 23-26.

NEW JERSEY

Meeting of Gastroenterologists.—The New Jersey Gastro-Enterological Society will hold an open meeting at the Jersey City Medical Center, Jersey City, December 1. The program will be presented by Drs. Ralph Colp, New York, who will speak on "Surgical Problems in Benign Lesions of the Small Intestine and Malignant Lesions of the Large Bowel", Edgar Burke, Jersey City, "Unusual Abdominal Surgical Cases," and Louis L. Perkel, Jersey City, who will present cases. Dr. Robert B. Lobban, assistant clinical professor of surgery, Columbia University College of Physicians and Surgeons, New York, will discuss Dr. Colp's paper.

Campaign Against Whooping Cough.—Public health officials in Newark and the WPA are cooperating in a campaign against whooping cough in children of preschool age, it was announced, October 29. The drive will run for twelve months, during which it is planned to immunize 6,000 preschool children at the sixteen baby clinics in Newark. The program follows a two year campaign against diphtheria carried on by the local health department and WPA. Twenty thousand children were immunized between January 1938, when the diphtheria campaign opened, and January 1941. During 1940 not 1 case of diphtheria was reported. Children not immunized at the WPA-city clinics invariably received the injections from their family physicians, it was stated. Four injections of vaccine are given at one month intervals in alternate arms. Two types are used, Sauer vaccine and detoxified antigen, which the health department is using as a check against the Sauer vaccine.

NEW YORK

Saranac Societies Announce Winter Schedule.—The Saranac Lake Medical Society and the Osler Club, Saranac Lake, opened their winter program with a talk, October 29, by Dr. David D. Rutstein, Albany, on "Present Status of the Diagnosis and Treatment of Rheumatic Heart Disease." On November 5 Drs. Leroy U. Gardner and Arthur J. Vorwald, Saranac Lake, conducted a clinical pathologic conference and on November 12 Dr. Charles C. Trembley, Saranac Lake, presented "Recollections of a Coroner." The program for the remainder of the season is as follows:

- Dr. Harold G. Wolff, New York, Headache Mechanisms, November 21
- Joseph Volker, D.D.S., Rochester, Radioactive Isotopes in Medical and Dental Research, November 26
- Dr. Leonard J. Schiff, Plattsburg, Horace Nelson and His Lancet, A Saga of North Country Medicine, December 3
- Dr. Henry C. Marble, Boston, The Care of Infections and Injuries of the Hand, December 10
- Dr. Frederick A. D. Alexander, Albany, N. Y., title to be announced, January 7
- Dr. Harry A. Bray, medical superintendent of the New York State Hospital, Ray Brook, and staff, Ray Brook Sanatorium Evening, January 14
- Canon Thomas, late canon in residence, Bermuda Cathedral, Relation ship Between Religion and Medicine, January 21
- Dr. Norman H. Plummer, New York, Newer Chemotherapeutic Methods, January 28
- Dr. William P. Thompson, New York, Hematologic Aspects of Tuberculosis of the Spleen and Lymph Nodes, February 4
- Dr. John N. Hayes, medical director of Sanatorium Gabriels, Gabriels, and staff, Gabriels Sanatorium Evening, February 11
- Charles Edward A. Winslow, D.P.H., New Haven, Conn., The History of the Germ Theory, February 19
- Dr. Siegfried J. Thannhauser, Boston, Xanthomatous Diseases and Veterans Administration Hospital (Sunmount) Evening, February 25
- Dr. Wayne L. Henning, medical director of the Stonywood Sanatorium, Lake Kusaquua, and staff, Stonywood Sanatorium Evening, March 4
- Dr. Ross Golden, New York, The Roentgenology of Diseases of the Terminal Ileum and Cecum, March 11
- Dr. Sara M. Jordan, Boston, Practical Problems of Peptic Ulcer, March 18
- Dr. George Wright, Trudeau Sanatorium, History of Pulmonary Physiology, March 25
- Melvin H. Knisely, Ph.D., Chicago, Microscopic Observations of the Circulation in Small Blood Vessels Under Normal Conditions and During Malaria and Other Diseases, April 1

New York City

Special Meeting on Heart Conditions.—The committee on cardiac clinics of the New York Heart Association will hold a meeting at the New York Academy of Medicine, November 25, at which Dr. Cary Eggleston will preside. The speakers will be Dr. Hilmert A. Ranges, whose subject will be "Measurement of Cardiac Output by the Ballistocardiograph and the Direct Fick Method", Drs. Cameron V. Bailey and Paul K. Boyer, "Concentration of Carbon Dioxide in Expired Air in Normal and Cardiac Patients," and Dr. Marcy L. Sussman, "Angiocardiograph in Congenital Heart Disease."

New Tuberculosis Unit.—Mayor LaGuardia laid the cornerstone of the new one hundred and fifty bed tuberculosis pavilion at River-side Hospital on North Brother Island, October 20. Dr. Willard C. Rappleye, commissioner of hospitals, and Irving V. A. Huie, commissioner of public works, officiated

at the ceremonies. The new pavilion will serve as a reception center for tuberculosis admission, as an infirmary for patients seriously ill and as a preoperative and postoperative service for patients in need of chest surgery. The mayor pointed out that, while more tuberculosis patient beds are needed by the city, the pavilion is expected to relieve the strain on other institutions of the department of hospitals and diminish the tuberculosis problem in the Harlem area, according to the *New York Times*. The three story brick building, begun last March at a cost of \$950,000, will be completed in February.

NORTH CAROLINA

Neurologic and Psychiatric Meeting.—The North Carolina Neurological and Psychiatric Association met at the State Hospital, Morganton, October 24. Papers were presented by Drs. John A. Rose, Winston-Salem, on "Changing Trends in Therapy", Paul Kimmelstiel, Charlotte, "Encephalitis", Leo Alexander, Durham, "Deficiency Diseases of the Nervous System," and a symposium on shock therapy by Drs. Roy H. Long and John R. Saunders, Morganton, Otto Billig, Mark A. Griffin and William R. Griffin, Asheville.

New Institute for Medical Research.—A group of buildings on the Bowman Gray estate, Winston-Salem, has been given to the newly opened Bowman Gray School of Medicine for the establishment of research laboratories for clinical investigation to be known as the Bowman Gray Institute for Medical Research. Mrs. Benjamin F. Bernard, who, with her husband, will continue to live in the home place on the estate, was the donor. In making the announcement Dr. Coy C. Carpenter, dean of the school, stated that, though the best facilities had been provided in the new medical school for undergraduate medical education, it had been feared that postgraduate education and clinical investigation would not be realized for many years. With the recent gift, he pointed out, research activities of the clinical divisions may be started at once. Plans have been completed to move the research activities of the clinical divisions to the new buildings as soon as they have been transformed into research laboratories. Work on the necessary reconstruction will begin at once.

OHIO

Personal.—Dr. William Sebald Keller, Glendale, has been commissioned senior surgeon in the U. S. Public Health Service Reserve and called to active duty as regional medical officer in the Fifth Civilian Defense Region, with headquarters in Columbus. For twenty-three years he has been president of the Cincinnati Social Hygiene Society and a member of the coordinating committee of the Cincinnati Public Health Federation.

OREGON

Changes in Health Officers.—Dr. Louis J. Wolf, Portland, has been named acting city health officer of Portland. He succeeds Dr. Adolph Weinzirl, who resigned to become professor of public health and preventive medicine at the University of Oregon Medical School, Portland.—Dr. Charles H. Barr, Portland, has been named health officer of Canby.

Society News.—Dr. Charles A. Haines, Ashland, discussed "The Complications of Midwifery" before the Jackson County Medical Society in Medford, September 10.—The Marion-Polk Medical Society was addressed in Salem, September 9, by Drs. Harry C. Blair, Portland, on "Use of Vitallium in Treatment of Acute Fractures" and Frank S. Dietrich, Portland, "Edema and Its Treatment."

Personal.—Dr. Donald Wair, formerly acting head of Eastern Oregon State Hospital, Pendleton, has been named permanent superintendent.—Dr. Wesley H. Haffner, Portland, has been appointed medical director of the Lane County Public Welfare Commission.—Dr. Raymond E. Watkins, professor and head of the department of obstetrics and gynecology, University of Oregon Medical School, Portland, has been appointed an associate editor of the *Western Journal of Surgery, Obstetrics and Gynecology*.

PENNSYLVANIA

Psychiatrists Choose Officers.—Dr. George J. Wright, Pittsburgh, professor of neurology, University of Pittsburgh School of Medicine, was chosen president-elect of the Pennsylvania Psychiatric Society at its annual meeting in Philadelphia, October 9, and Dr. Baldwin L. Keyes, Philadelphia, clinical professor of psychiatry at Jefferson Medical College, was inducted into the presidency. Dr. Le Roy M. A. Maeder, Philadelphia, is the secretary-treasurer. Dr. William C. Porter, Washington, D. C., lieutenant colonel, M. C. U. S. Army, addressed the session on "Psychiatry and the National Defense."

Philadelphia

Cancer Research Abandoned for Lack of Funds.—Newspapers reported on September 25 that the cancer control division of the state department of health, organized two years ago for research purposes, had been discontinued. The discontinuance of federal funds for this work was given as the reason for abandoning the project.

Dr. Waltman Walters to Lecture.—Dr. Waltman Walters, Rochester, Minn., will lecture at the Klahr Auditorium, November 18, under the Constantine Hering Fund of the Hahnemann Medical College and Hospital of Philadelphia on "Malignant Lesions of the Stomach." A dinner at the Union League will precede the lecture in honor of Dr. Walters.

TEXAS

Annual Postgraduate Assembly.—The Post Graduate Medical Assembly of South Texas will present its tenth annual clinical meeting at the Rice Hotel, Houston, on December 4. The session is a project of the Eighth, Ninth and Tenth Councilor districts of the state medical society. The speakers presenting the program will be:

Dr. Arthur F. Abt, assistant professor of pediatrics, Northwestern University Medical School, Chicago.

Dr. Arthur W. Allen, chief, East Surgical Service, Massachusetts General Hospital, Boston.

Dr. Russell L. Cecil, professor of clinical medicine, Cornell University Medical College, New York.

Dr. Rolla E. Dyer, senior surgeon, U. S. Public Health Service, Washington, D. C.

Dr. Edwin C. Hamblen, associate professor of obstetrics and gynecology, Duke University School of Medicine, Durham, N. C.

Dr. Robert H. Ivy, professor of maxillofacial surgery, University of Pennsylvania School of Medicine, Philadelphia.

Dr. Marvin F. Jones, formerly professor of otolaryngology, New York Post-Graduate Medical School, Columbia University, New York.

Dr. Foster S. Kellogg, clinical professor of obstetrics, Harvard Medical School, Boston.

Dr. Samuel J. Kopetzky, professor of otology, New York Polyclinic Medical School and Hospital, New York.

Dr. Walter I. Lillie, professor of ophthalmology, Temple University School of Medicine, Philadelphia.

Dr. William C. MacCarty, professor of pathology, University of Minnesota Graduate School, Minneapolis-Rochester.

Dr. Karl A. Menninger, chief of staff, Menninger Clinic, Topeka, Kan.

Dr. Cecil S. O'Brien, professor and head of the department of ophthalmology, State University of Iowa College of Medicine, Iowa City.

Dr. Robert D. Schock, professor of orthopedic surgery and chairman of the department, University of Nebraska College of Medicine, Omaha, Neb.

Dr. George G. Smith, urologist, Massachusetts General Hospital, Boston.

GENERAL

Nobel Prizes Not to Be Awarded This Year.—It was reported, October 18, that the Swedish government has decided that the Nobel prizes shall not be awarded this year.

Place Changed for Orthopedic Meeting.—Because of the crowded conditions of the hotels in Washington, D. C., the executive committee of the American Academy of Orthopedic Surgery has changed the place of meeting for the January convention to Atlantic City. Examinations of the board will therefore be held at the Chalfonte Haddon Hall, Atlantic City, instead of the Mayflower Hotel in Washington, January 9-10.

Fees Increased for Pediatric Examination.—The American Board of Pediatrics announces an increase in its application fee from \$30 to \$50, effective May 1, 1942. It is the intention of the board to accept all applications from eligible physicians postmarked prior to May 1, 1942 at the old rate of \$30. The action was taken only after it had been demonstrated that it cannot continue without increased income.

Grants for Research.—The Committee on Scientific Research of the American Medical Association invites applications for grants of money to aid in research in problems bearing more or less directly on clinical medicine. Preference is given to requests for modest amounts to meet specific needs. As a rule, grants are not made for the purchase of equipment or apparatus of a permanent nature. For application forms and further information please address the committee at 535 North Dearborn Street, Chicago.

Fellowships in Extramural and Child Psychiatry.—The National Committee for Mental Hygiene announces a limited number of fellowships for training in extramural and child psychiatry. Selected fellows will spend one or two years in a designated clinic, the term and plan of the fellowship to be determined by the peculiar needs of the applicant. Candidates should have had at least a general internship and two years of psychiatry in an approved mental hospital service in addition to other qualities fitting them for extramural service. The stipends vary slightly with location and status of the fellow

but in general range between \$2,000 and \$2,600. Additional information should be obtained from Dr. Milton E. Kirkpatrick, National Committee for Mental Hygiene, 1790 Broadway, New York.

Counterfeiter Levinsohn Apprehended.—Marvin Levinsohn, alias Martin Davis, passer of counterfeit checks on the "Quartermaster Bank of the United States," was apprehended in Kansas City, Mo., October 27, while he was in a physician's office awaiting a pneumothorax treatment. The physician recognized Levinsohn from the information in a news item in *THE JOURNAL*, October 25, page 1455, and called the local Secret Service office. Fourteen blank counterfeit checks were in Levinsohn's possession when he was picked up. He was also in army uniform. Levinsohn was sentenced, November 1, to three years in the penitentiary. He is now confined in Leavenworth Penitentiary, Leavenworth, Kan., where he will serve seven months of a former sentence for violation of parole. The three year term will follow. During his period of incarceration Levinsohn will be given treatment for tuberculosis.

Another Physician Defrauded—Warning.—A physician in Carbondale, Colo., writes that he ordered a small steel enameled office table with shelf from the U. S. Distributing Company of Chicago, paying for it by check. The order was sent in on receipt through the mail of a card advertising the table. He received much later a standard post card on which was a typewritten acknowledgment of the order and a statement that it would be filled "in order." It was signed "L. R. Perlman." The physician writes that the table has never been delivered, although the canceled check has been returned. There is no record in the headquarters of the American Medical Association of the U. S. Distributing Company of Chicago. Inquiries at the bank where the check was cashed revealed that Perlman, identified as "sole owner," had disappeared from his usual habitats and that a number of inquiries had come in concerning him. Physicians are urged to be wary of any form of solicitation unless ample proof is afforded establishing the reputability of salesmen or firms which they claim to represent.

Society News.—Dr. James A. Babbitt, Philadelphia, was named president-elect of the American Academy of Ophthalmology and Otolaryngology at the annual meeting in Chicago, October 19-23. Dr. Babbitt will assume the presidency Jan. 1, 1943 and Dr. Ralph I. Lloyd, Brooklyn, will become president Jan. 1, 1942. Vice presidents elected were Drs. Walter H. Theobald, Chicago; Forrest J. Pinkerton, Honolulu, T. H., and Francis E. LeJeune, New Orleans. Dr. Secord H. Large, Cleveland, was reelected comptroller and Dr. William P. Wherry, Omaha, executive secretary-treasurer. Next year's meeting will be in San Francisco in October. At the annual banquet Dr. Harry S. Gradle, Chicago, received an engraved watch commemorating his twenty-one years of service to the academy. Drs. Conrad Berens and Samuel J. Kopetzky, New York, and Jonas S. Friedenwald, Baltimore, were elected to the honor society.—Dr. Arthur P. Keegan, Philadelphia, was elected president of the International Association of Police and Fire Surgeons and Medical Directors of Civil Service Commissions at its annual meeting in Washington, D. C. The following officers were reelected: Drs. Maxwell Cherner, Philadelphia, vice president; John J. White, New York, treasurer; Harry M. Archer, New York, secretary.

Western Surgical Association.—The fifty-first annual meeting of the Western Surgical Association will be held at the St. Paul Hotel, St. Paul, December 5-6, under the presidency of Dr. Albert H. Montgomery, Chicago. Among the speakers on the program will be:

Drs. Samuel C. Plummer, Boulder, Colo., and Theodore L. Hansen, Chicago, Sarcoma as a Complication to Paget's Disease.

Drs. Max M. Zininger and William A. Altmeier Jr., Cincinnati, Incidence of B. Welchii Contamination in Fresh Traumatic Wounds.

Drs. Stanley J. Seeger and Arthur A. Schaefer, Milwaukee, Deep Infections of the Neck.

Drs. William T. Peyton, Minneapolis, and Lyle A. French, Springfield, Mo., The Surgical Relief of Intractable Pain.

Capt. Frederick R. Hook, M. C., U. S. Navy, Washington, D. C., Some of the Problems of the Naval Medical Department.

Drs. Verne C. Hunt and Clarence J. Berne, Los Angeles, Amelie Abscess of the Liver.

Dr. Herman L. Kretschmer, Chicago, Stone in the Ureter: A Critical Review of Five Hundred Cases.

Drs. Warren H. Cole and Paul W. Greeley, Chicago, The Plastic Correction of Vascular and Pigmented Nevi.

Drs. Fred W. Bailey, and Francis Jacob Dean Sauer, St. Louis, Abdominal Aorta Thrombosis—Treatment with Heparin.

Drs. Virgil S. Counsellor and Daniel A. McKinnon Jr., Rochester, Minn., Factors Influencing the Incidence of Postoperative Thrombophlebitis in Gynecologic Operations.

Drs. Charles G. Johnston, Rudolf J. Noer and John E. Manning, Detroit, A Comparative Study of the Small Intestinal Circulation.

Drs. Frederick A. Collier and Henry K. Ransom, Ann Arbor, Carcinoma of the Rectum, Experiences with Single Stage of Aldomino-perineal Resection.

New Commission for Hospital Service Plan.—The first permanent Hospital Service Plan Commission of the American Hospital Association was established during the annual meeting of the association in Atlantic City, September 15. A Commission on Hospital Service has been functioning since 1937 under a five year grant, but in 1940 the American Hospital Association named an "interim commission" to serve pending action by its house of delegates, which would make a permanent organization possible. At the recent meeting the association's constitution and by-laws were amended to include the new commission as a part of the association. Representatives of thirty-eight service plans voted at the session. The new project is to be financed by the cooperating service plans. Hospital administrators on the commission include Dr. Benjamin W. Black, medical director of the Alameda County Institutions, Oakland, Calif.; Mr. F. Stanley Howe, superintendent of Orange Memorial Hospital, N. J.; Dr. Herman Smith, medical superintendent of Michael Reese Hospital, Chicago, and Dr. Peter D. Ward, medical superintendent, Charles T. Miller Hospital, St. Paul. E. A. Van Steenwyk, Philadelphia, John Mannix, Detroit, and Dr. Sigismund S. Goldwater, New York, are the plan managers of the commission. George Putnam, Boston, and John A. Connor, Columbus, Ohio, both plan trustees, are the remaining members of the commission. Mr. Van Steenwyk was chosen chairman and Mr. Mannix, vice chairman. Clarence Rufus Rorem, Ph.D., Chicago, director of the original commission, will continue as director of the new commission.

The American Physicians' Art Association.—At the annual exhibition of the American Physicians' Art Association, which will be held in Atlantic City June 8-12, 1942, during the annual meeting of the American Medical Association, the art exhibits will be displayed in a room on the ground floor of the convention auditorium. The exhibitors will not be charged a fee for the hanging of their exhibits nor will they have to pay express charges for shipping art pieces of any type to or from Atlantic City. The secretary of the American Physicians' Art Association, Dr. Francis H. Redewill, 521 Flood Building, San Francisco, announces that Mead Johnson and Company will assist the art association in obtaining a large number of prizes for all classes of exhibitors. Any member of the American Medical Association is eligible to membership in the American Physicians' Art Association on the payment of a fee of \$1 a year. Any delinquent dues for the past few years will not be charged against any one. The other officers of the art association are: Drs. Robert F. Ridpath, Philadelphia, president; Samuel M. Gellert, Portland, Ore., vice president, and Raleigh W. Burlingame, San Francisco, treasurer. Following are the trophy winners at the annual exhibition in Cleveland last June:

Grand Prize: Dr. Edward E. Woldman, Cleveland. Dr. Woldman refused the prize, so it was given to Dr. Fred L. Knowles, Fort Dodge, Iowa, "Portrait, Jane Knowles."

Special Award: Dr. Woldman. This prize was created by the jury because of Dr. Woldman's refusal of the grand prize.

Oil Painting: First prize, Dr. Louis J. Karnosh, Cleveland, "Services Discontinued." Honorable mention, Dr. Robert H. Kennicott, Los Angeles, "Life of the Party." Honorable mention, Dr. William W. Wright, West Hartford, Conn. Honorable mention, Dr. Meyer Morton Melicow, New York, "Rockport, Mass."

Photography: First prize, Dr. Donald W. Johnson, Fairmont, Minn. Honorable mention, Dr. Edward N. Kline, Cleveland. Honorable mention, Dr. Max Thorek, Chicago.

Ceramics: First prize, Dr. Leon Goldman, Cincinnati. Honorable mention, Dr. Paul E. W. Wedgewood, San Diego, Calif.

Etching: First prize, Dr. Josef Warkany, Cincinnati, "Cliff Dwellers." Honorable mention, Dr. Nils P. Larsen, Honolulu, T. H.

Pastels: First prize, Dr. Robert F. Ridpath, Philadelphia, "Lillian." Honorable mention, Dr. George V. Smith, South Euclid, Ohio, "Landscape."

Water Colors: Honorable mention, Dr. William Rowland Davies, Scranton, Pa.

Sculpture: First prize, Dr. Robert N. MacGuffie, Passaic, N. J., "Jane." Honorable mention, Dr. Emil Seletz, Los Angeles, "Will Rogers." Honorable mention, Dr. Adolph M. Brown, Chicago, "Joe Beck."

Homer Wheelon Medal for originality and artistry in oils: Dr. Francis H. Redewill, San Francisco, "Wall of Windows, Bryce Canyon."

Cleveland Award Opens Campaign for Cancer Funds.

—The Clement Cleveland Medal, given annually for conspicuous service to cancer education, was presented to Abbott Kimball, president of the advertising firm bearing his name, at a dinner in the Advertising Club, October 22, given by the New York City Cancer Committee. In accepting the medal, Mr. Kimball said that the award "marked a milestone in the practice of medicine," being "the first time that a medical society of any kind has ever given the highest award in its power for a job of advertising and publicity," the New York Times reported. The dinner marked the opening too of the cancer committee's fifteenth annual campaign for funds "to fight cancer with knowledge." Another feature of the dinner was the presentation of a testimonial from the American Society for the Control of Cancer to Dr. John C. A. Gerster in recognition of his

fifteen years of service as chairman of the New York City Cancer Committee. Speakers at the dinner included John Benson, president of the American Association of Advertising Agencies, who discussed "Public Service in Advertising"; Charles D. Coburn, New York, who spoke on "An Actor Looks at a Doctor," and Clarence C. Little, D.Sc., Bar Harbor, Maine, managing director of the American Society for the Control of Cancer, who paid tribute to the record of the local committee. It was announced at the dinner that Dr. John E. Moseley, Negro physician who had served as assistant in the outpatient department of Harlem Hospital, had been appointed on a special fellowship from the National Cancer Institute to study radiotherapy at Bellevue Hospital under Dr. Ira I. Kaplan, director of the department. The decision to select a Negro physician for special training was made after it had been ascertained that no facilities were available in Harlem Hospital for giving radium and roentgen treatment. Dr. Ludvig Hektoen, Chicago, executive director of the National Advisory Cancer Council, helped to obtain a grant from the National Cancer Institute, and W. S. Schwabacher, a member of the local cancer committee, obtained supplementary funds to finance the training.

Government Services

Public Health Service Engineer Dies

Leslie C. Frank, retired senior sanitary engineer of the U. S. Public Health Service, Washington, D. C., died, September 4, while on a visit to Toronto, Ont., aged 54. Mr. Frank retired last February because of ill health. He was president of the International Association of Milk Sanitarians.

Conference on Evaluation of Tests for Syphilis

The North American Serologic Conference opened in Washington, October 20, under the auspices of the U. S. Public Health Service, Washington, D. C., and the Committee on Evaluation of Serodiagnostic Tests for Syphilis, to determine, if possible, the most accurate test for syphilis. The conference will continue for a month, during which leading serologists of Cuba, Mexico, Canada and the United States will seek through competitive analysis to evaluate new tests. Two similar conferences have taken place in Copenhagen, one in Montevideo and one in Washington in 1935. Members of the Committee on Evaluation of Serodiagnostic Tests for Syphilis include Drs. Thomas Parran, surgeon general of the U. S. Public Health Service, chairman; Henry H. Hazen, Washington, D. C.; John F. Mahoney, Staten Island, N. Y., senior surgeon of the service; Arthur H. Sanford, Rochester, Minn.; Francis E. Senear, Chicago; Walter M. Simpson, Dayton, Ohio. Dr. Raymond A. Vonderlehr, assistant surgeon general, Washington, D. C., is in charge of venereal disease control for the service.

Director of Health Supplies and Drug Division Named

John N. McDonnell, D.Sc., assistant professor of pharmacy, Philadelphia College of Pharmacy and Science, and editor of the *American Professional Pharmacist*, has been chosen to head the health supplies and drug division of the Bureau of Research and Statistics of the Office of Production Management, Washington, D. C. Dr. McDonnell will set up a research group to assemble at once all available data concerning the present supply of and demand for drugs and allied chemicals. According to an announcement, the classification of raw and finished drug materials into those essential for civilian and military health, and the control of such as are deemed of lesser importance, will be followed by a study of possible expansion of present manufacturing and processing facilities to care for the emergency demands of foreign and domestic agencies. The work of the new research group will serve to provide complete factual knowledge of the entire drug industry to the other divisions of OPM, to insure complete medical supplies for the nation's armed forces and to guarantee supplies of bulk materials and other products so that production of civilian drug necessities will be maintained. Dr. McDonnell received his degree in pharmacy and his master's and doctor of science degrees in bacteriology and hygiene at the Philadelphia College of Pharmacy and Science, where, in addition to his professorship, he is also assistant registrar and curator.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 27, 1941.

Educating the Public in Protection Against Poison Gas

A campaign to educate the public in the dangers of and protection against poison gas has been inaugurated by the Ministry of Home Security. An exhibition has been opened in London and a simple version of this will be shown at thirteen centers in Great Britain and Northern Ireland. After showings of six weeks at these sites the exhibitions will be moved to other towns and will circulate in this manner for some twelve months. The message of the exhibitions is that, unlike high explosive bombs, war gas on the whole is not a killing weapon and can be beaten by those who make use of sensible protection. The exhibitions explain the types of war gases which may be used and how decontamination and cleansing can be done. Protection for children, food and domestic animals is dealt with, and a complete, concise survey is given of all instructions for civilian behavior during a gas attack. In opening the London exhibition, the parliamentary secretary to the Ministry of Home Security, Mr. William Mabane, emphasized the dangers of gas against civilians as well as its limitations. People should learn all they could about gas from the ministry's books, lectures, instructors and wardens. Masks should always be carried and kept in good repair. In case of any doubt about a mask, it should be taken to a warden's house. There should be exercises in putting on the mask quickly and effectively. A second lost might mean death or disfigurement. We would never use gas in the war except in retaliation, so the advantage of surprise rested with the enemy. If we were prepared, gas would be stripped of its terror and could do but little harm.

The minister of health has issued a circular asking the public to practice the use of their masks in their homes and asking the managers of hospitals to insure that workers who are not resident bring their masks with them and that all workers keep their masks handy; the workers are also asked to arrange practice periods from time to time in putting the masks on quickly. In the case of the patients, discretion must be used in arranging for their practicing in the use of the mask. For those suffering from certain disabilities, such as asthma, heart disease or facial distortions, special respirators with outlet valves or helmet respirators are issued.

Emergency Food Plans

Lord Woolton, minister of food, has described food plans which have been drawn up for any emergency. They are based on the assumption that communications have broken down "in the most severe blitz that our most pessimistic imagination could devise." Stocks of food have been widely scattered so as to limit the quantity that could be destroyed in any one air attack. For this purpose, Great Britain is divided into many areas, each independent in the matter of emergency food stocks for several weeks. Traders in the districts have arranged between themselves mutual pacts of assistance so that if one is knocked out of business his customers will be looked after by others. "Shadow" shopping centers have been chosen by the ministry for use if existing shopping districts are extensively damaged. If necessary, traveling shops will be put on the roads. For the smaller places that have no food office of their own some two thousand five hundred voluntary food organizers have been appointed. They have undertaken to distribute emergency food stocks—government property—if their district should be isolated. The stocks consist of biscuits, corned beef, canned soup, canned sugar, canned margarine and tea. Each of the

nineteen divisional food officers in the country has one or more such convoys under his control—self-contained units ready to go out at a moment's notice. The next line of defense is the British restaurants. The third is the emergency meal centers. The rest centers (for persons rendered homeless by air raids) and the air-raid shelters are the fourth and fifth lines of defense. The Ministry of Food has arranged for supplies of food in these places. All the catering establishments of London have been brought into the emergency arrangements under a unified scheme. A new development is the "food grid"—a cooking depot established 7 to 10 miles outside the town it is meant to serve. It will function if the other centers are put out of action. Each can produce six thousand meals in four hours and send them into the town by mobile canteen or car. Cooking depots to cover a population of 7,400,000 are under construction or in being.

Extensive arrangements have been made for the salvaging of damaged food supplies. Food that has been in water must be dried, and for this purpose the drying plants of various industries have proved valuable. The Ministry of Food has compiled a register of one thousand five hundred such drying plants. Food must be protected against poison gas. For this purpose gas-resisting tarpaulins have been provided.

The American Ambulance in Great Britain

All over Great Britain the large blue-gray cars of the American Ambulance, Great Britain, bearing in a circle the crossed flags of Great Britain and the United States of America, have become familiar. Behind this organization of two hundred and sixty motor ambulances, surgical units and mobile first-aid posts lies a story. For forty-two years American residents have been banded together into the American Society in London and have celebrated Independence Day with a banquet and a ball. But in the spring of 1940 when the society met to decide on the nature of the next celebration, the honorary secretary, Mr. Gilbert H. Carr, said that anything of this nature would now be out of place. The thing for Americans who had enjoyed the hospitality of Great Britain to do was not to celebrate but to make a gesture of assistance. From this suggestion grew the American Ambulance, Great Britain, for the rapid transportation of complete surgical units to areas in which they are most required. In twelve months they have traversed 1,728,992 miles and carried 71,511 patients. Mr. Carr is now director general of the American Ambulance and must be the hardest worked American in the British cause, for he is also honorary secretary of the American Committee for Air Raid Relief and of the Advisory Committee of the British War Relief Society of America. The work done by the ambulance comprises evacuation of hospital and transfer of patients from one hospital to another, to convalescent homes or to their own homes on recovery. Of the women drivers, all but two are British. Some of them are veterans who drove in France in the last war.

The London Hospital

The London Hospital, the largest hospital in the metropolis, was founded in 1741. It has a roof space of 10 acres, and its normal bed accommodation runs to nine hundred. It has suffered severely in air raids and now maintains only three hundred and sixty beds, of which one hundred and sixty are reserved for air raid casualties. It has an annex in the country with two hundred and fifty-two beds, which are to be increased to three hundred and sixty. The London Hospital has received direct hits from high explosive and incendiary bombs and has had thirty-five thousand windows destroyed. But it has never been put out of action, though there have been temporary stoppages of lighting and power. Damage has been done to the nurses' homes, the laundry and the outpatient department but not to the wards.

RIO DE JANEIRO

(From Our Regular Correspondent)

Sept. 20, 1941.

Postoperative Circulatory Changes

Dr. J. P. Sodré, surgeon at the Hospital Pronto Socorro of Rio de Janeiro, has described the metabolic changes observed in the patients he operated on in that municipal emergency hospital. He emphasizes that it is on the circulatory system that the operation causes the more important changes, in particular on the blood pressure and on the pulse rate. Very important are the alterations caused by anesthesia: the gaseous anesthetics and avertin with amylene hydrate contribute to increase the blood pressure, while ether, chloroform and spinal anesthesia tend to lower it, and local anesthesia is practically without influence. Dr. Sodré presented the following figures concerning alterations in the blood pressure and pulse rate observed in 687 operations. In a series of 124 operations performed under local anesthesia, 50 per cent of the patients presented no changes in the blood pressure, 40 per cent showed an average decrease of 15 mm. and in 10 per cent it was increased an average of 10 mm.; in 45 per cent of the patients the pulse rate diminished about 12 beats, in 40 per cent it increased about 9 beats and in 15 per cent it presented no change. In a series of 163 operations under spinal anesthesia, 80 per cent of the patients presented an average decrease of 22 mm. in the blood pressure, 7 per cent showed an average increase of 17 mm. and 13 per cent presented no change; in 58 per cent the pulse rate diminished about 15 beats, in 30 per cent it increased about 9 beats and in 12 per cent it presented no change. In a series of 400 operations in which ether or chloroform were used, 66 per cent of the patients presented an average decrease of 15 mm. in the blood pressure, 23 per cent showed an average increase of 18 mm. and 23 per cent presented no change; in 62 per cent the pulse rate increased about 16 beats, in 25 per cent it decreased about 12 beats and in 13 per cent there was no change.

The Pathogenicity of BCG Vaccine

Dr. Arlindo de Assis, a bacteriologist, and Dr. Amadeu Fialho, a pathologist, have just published the results of experiments on the pathogenicity of the Calmette-Guérin bacillus. Nine adult rabbits, previously recognized as nonreactors by intradermal tuberculin tests, were injected intratesticularly with doses amounting to 1 to 50 mg. of heat killed BCG suspended in from 0.5 to 1 cc. of sterile liquid petrolatum. Local reactions followed early in the first week, consisting of intense redness, severe edema and enlargement of the testicles. In most cases caseous abscesses developed at the site of inoculation. Tuberculin hypersensitiveness could easily be disclosed after the third or fourth week. The weight and general health of the animals seemed not to be damaged by the BCG, and 7 rabbits survived after three hundred days. One rabbit inoculated with 25 mg. and one inoculated with 50 mg. were found dead after fifty-three and seventy-five days, respectively. Both these rabbits showed enlarged lungs, with a vesicular bubble appearance. Since no truly tuberculous lesions could be detected in the lungs of either rabbit and since a passive congestion was found in the livers of both, it is much more probable that the animals may have died from circulatory disturbances rather than from any kind of tuberculous disease. Three rabbits have been killed for a check up on the pulmonary changes which happened to occur under the influence of different doses of BCG. Another rabbit which had been inoculated with 50 mg. was killed after one hundred and twenty days, while 2 others (inoculated respectively with 1 and 10 mg.) were killed after two hundred and twenty-seven and two hundred and forty-three days. All these animals showed lungs of normal volumes, without any kind of caseous or pneumonic change, although a variable degree of nodular lesions could be found. To sum

up the main macroscopic pathologic changes disclosed at the autopsies it can be said that a clearcut difference has been reported between the lesions observed at the site of the inoculation and the ones found in distant organs. While the non-inoculated testicles remained always free from any change, the testicular parenchyma and a few lymph nodes presented both nodular proliferative lesions (quite similar to those occurring in distant organs) and intensively caseated areas yielding abundant pus and big clumps of acid-fast bacilli. Apart from these local features, only a definite enlargement of the abdominal lymph nodes and nodular lesions in the lungs could be found, always unaccompanied by caseous changes. Specific lesions always failed to appear in the spleen and the liver, although sometimes the involvement of small lymph nodes of the capsules of those organs have been noted.

Microscopic sections of the lymph nodes and lungs disclosed a complex lesion around liquid petrolatum droplets conveyed through the lymph stream from the site of the inoculation. Frozen sections stained by scarlet red and sudan III showed that those droplets were liquid petrolatum conveying a variable amount of acid-fast bacilli easily stained by routine methods. Each droplet became the center of a complex lesion surrounded by a narrow zone of cellular necrosis, instead of the well known homogenous mass necrosis characteristic of lesions caused by virulent tubercle bacilli. A layer of proliferating cells, derived from the reticuloendothelial system surrounded the destructive zone. A significant phagocytic activity both for cellular debris and for lipids and fat particles seemed characteristic of that proliferative tissue. In the lungs, such purely proliferative features occurred in scattered foci throughout the whole organ, the commonest ones having been found at the alveoli. Moderate cellular proliferation filled the alveolar cavities. Far advanced proliferation of the same cells brought out more profound changes, with a complete disappearance of the alveolar outline, which was replaced by a tumor-like growth. The spleen and liver proved to be free from destructive lesions, only proliferation being found there. Acid-fast bacilli failed also to appear in those organs.

It may be assumed that the synergistic action of intratesticular injections of heat-killed BCG in liquid petrolatum in the rabbit proved comparable to that obtained when the introduction of the mixtures follows other routes. However, the testicular route seems to promote intense local caseous changes as well as to cause dispersion of the mixture throughout the lymphatic system up to the lungs. Disregarding the local reaction, BCG proved incapable of producing a true pattern of tuberculous disease in the rabbit. Only necrobiotic changes could be disclosed as the direct consequence of the bacillary bodies plus paraffin oil in the lungs and the lymph nodes situated far from the site of inoculation. An intense stimulation seemed to be transmitted to the reticuloendothelial system by BCG under the reinforcing influence of the liquid petrolatum so that a great deal of cellular proliferation took place in several organs (lungs, spleen, liver), although none of them should be considered specific.

Marriages

J. LAMAR CALLAWAY, Durham, N. C., to Miss Catharine Van Blarcom of Hawthorne, N. J., October 11.

DAVID O. N. LINDBERG, Decatur, Ill., to Miss M. Helen Gray of Ann Arbor, Mich., recently.

CARL ERVING ADAMS, Nashville, Tenn., to Miss Jennie Mae Mitchell of La Vergne in August.

MORRIS WILBURNE, Chicago, to Miss Shirley Winters of New York, October 25.

TILDEN H. PHIPPS JR. to Miss Dorothea Rights, both of Tampa, Fla., August 9.

LEWIS E. JANUARY to Miss Eloise Taylor, both of Iowa City, September 13.

Deaths

Hugh McCormick Smith, Washington, D. C.; Georgetown University School of Medicine, Washington, 1888; associate curator of zoology at the Smithsonian Institution; entered the United States Fisheries Commission, now the United States Bureau of Fisheries, in 1886; director of the biologic laboratory of the United States Fisheries Commission, Woods Hole, Mass., 1901-1902; deputy commissioner of fisheries from 1903 to 1913; United States commissioner of fisheries from 1913 to 1922; member of the medical faculty at his alma mater in 1888 as demonstrator in anatomy and curator of the museum; in 1890 was assistant to the professor of physiology, and lecturer in medical botany; in 1891 assistant to the professor of physiology and to the professor of general pathology and histology; in 1896 adjunct professor of anatomy in charge of normal histology; in 1897 was appointed professor of normal histology, and in 1902 resigned as professor of histology; represented the United States at international fishery congresses; member of the American Ornithologists' Union, American Society of Naturalists, American Fisheries Society, serving as president, 1907-1908; past president of the Biological Society of Washington; secretary general of the fourth International Fishery Congress in 1908; at one time adviser in fisheries to the Siamese government and director of the Siamese Department of Fisheries; aged 75; died, September 28, of coronary thrombosis, arteriosclerosis and heart disease.

Mark Homer Rogers • Boston; Harvard Medical School, Boston, 1904; assistant professor of orthopedic surgery at the Tufts College Medical School from 1915 to 1924 and since 1924 professor; member of the American Orthopedic Association and the American Academy of Orthopedic Surgeons; fellow of the American College of Surgeons; served during the World War; orthopedic surgeon, Massachusetts General Hospital from 1906 to 1924; chief, orthopedic service, Beth Israel Hospital; orthopedic surgeon, New England Deaconess Hospital; orthopedic consultant, Henry Heywood Hospital, Gardner, Mass., and the Evangeline Booth Home and Hospital; consultant in orthopedic surgery of the Joseph H. Pratt Diagnostic Hospital; associate surgeon to sixth surgical service, Boston City Hospital; orthopedic surgeon, Boston and Maine Railroad; orthopedic consultant to the United States Public Health Service; associate in orthopedic surgery at the Harvard Medical School, Courses for Graduates; aged 64; died, October 5, in the George F. Baker Clinic of the New England Deaconess Hospital of cerebral embolism and heart disease.

George Herman Powers • Boston; University of California Medical Department, San Francisco, 1902; member of the American Otological Society, Inc., New England Otological and Laryngological Society and the New England Pediatric Society; assistant in otology at the Harvard Medical School from 1914 to 1916 and instructor, 1916-1917; served in various capacities on the staffs of the Massachusetts Eye and Ear Infirmary and Boston City Hospital; consulting surgeon, Quincy (Mass.) City Hospital and the Leonard Morse Hospital, Natick; aged 63; died, October 4, at his home in Medfield.

Frederick Conrad Schurmeier • Elgin, Ill.; Rush Medical College, Chicago, 1902; past president of the Kane County Medical Society; fellow of the American College of Surgeons; served as a member and president of the board of education; city physician from 1905 to 1907; member of the board of trustees of the Kane County Springbrook Sanitarium, Aurora; attending surgeon, Sherman and St. Joseph's hospitals; aged 69; died, October 6, of coronary thrombosis.

Alfred Frederick Jacobson, Chicago; Northwestern University Medical School, Chicago, 1905; in 1907 clinical assistant, in 1923 instructor and in 1925 associate in the department of dermatology at his alma mater; was associated with the city health department continuously since 1907, at which time he had the title of school inspector and since 1909 field health officer; aged 61; died, October 3, of carcinoma.

Herbert Miller Manning • Surgeon, United States Public Health Service, retired, Washington, D. C.; Columbian University Medical Department, Washington, 1900; entered the United States Public Health Service July 15, 1903 and retired Sept. 1, 1933; veteran of the Spanish-American War; aged 63; died, October 11, in the United States Marine Hospital, Baltimore.

Francis James McKown, Carmel, N. Y.; Albany Medical College, 1897; member of the Medical Society of the State of New York; past president of the Putnam County Medical Society; for many years county coroner, and health officer of

the towns of Carmel and Kent; past president of the board of education; aged 68; died, October 9, of coronary heart disease.

J. Louis Preston • Salamanca, N. Y.; University and Bellevue Hospital Medical College, New York, 1913; past president of the Medical Society of Cattaraugus County; formerly physician for the public schools; served during the World War; aged 52; on the staff of the City Hospital, where he died, October 3, of injuries received in an airplane accident.

Hallie Mayo Ratliff • New York; Medical College of Virginia, Richmond, 1911; formerly adjunct professor of gynecology and clinical professor of gynecology and obstetrics at the New York Polyclinic Medical School and Hospital; fellow of the American College of Surgeons; served during the World War; aged 57; died, September 29, of coronary thrombosis.

Louis Cyriaque Charland, Montreal, Que., Canada; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1902; served with the Canadian Army during the World War; formerly medical examiner of the Pension Board of Ottawa, Ont.; aged 63; died, September 7, of cardiovascular renal disease and uremia.

Arthur Elliott Owen • Lansing, Mich.; Detroit College of Medicine, 1907; past president of the Ingham County Medical Society; fellow of the American College of Surgeons; served during the World War; on the staffs of St. Lawrence Hospital and the Edward W. Sparrow Hospital; aged 58; died, October 8, of coronary occlusion.

Samuel Meredith Wilson, Lynchburg, Va.; University College of Medicine, Richmond, 1907; member of the Medical Society of Virginia; on the staffs of the Lynchburg General Hospital, Marshall Lodge Memorial Hospital and the Virginia Baptist Hospital; aged 56; died, September 14.

Grover Cleveland Terrell, Prentiss, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1910; member of the Mississippi State Medical Association; formerly county health officer; aged 56; died, September 26, of injuries received in an automobile accident.

Irvin John Pascoe, Park Ridge, Ill.; Chicago College of Medicine and Surgery, 1910; member of the Illinois State Medical Society; served during the World War; health officer; on the staff of the Walther Memorial Hospital, Chicago; aged 56; died, October 19, of coronary thrombosis.

Albert James Reycraft, Fostoria, Ohio; Detroit College of Medicine, 1895; member of the Ohio State Medical Association; past president of the Hancock County Medical Society; aged 79; died, October 3, in the Lakeside Hospital, Cleveland, of bronchopneumonia and arteriosclerosis.

Harrison Benjamin Talbot • Topeka, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1913; vice president and medical director of the National Reserve Life Insurance Company; aged 53; died, September 30, in St. Francis Hospital.

Milton Lee Martin, Denton, Texas; University of Texas Medical Department, Galveston, 1899; member of the State Medical Association of Texas; past president and secretary of the Denton County Medical Society; aged 72; died, September 27, of carcinoma of the intestine.

Vernon Otis Buttram • Crossville, Tenn.; University of Tennessee College of Medicine, Memphis, 1929; aged 39; died, October 1, in the Vanderbilt Hospital, Nashville, of injuries received when he fell from a speeding ambulance while attempting to close the door.

Daniel Cantarow, West Hartford, Conn.; Tufts College Medical School, Boston, 1911; member of the Connecticut State Medical Society; on the consulting staff of the Mount Sinai Hospital, Hartford; aged 67; died, October 1, of pulmonary edema and chronic nephritis.

John Henry Bird, Rock, W. Va.; Maryland Medical College, Baltimore, 1905; member of the West Virginia State Medical Association; member and formerly president of the county board of education; aged 63; died, October 14, of coronary thrombosis.

William Patrick Brady, Buffalo; Georgetown University School of Medicine, Washington, D. C., 1937; member of the Medical Society of the State of New York; aged 31; died, October 15, in the Georgetown University Hospital, Washington, D. C.

Lawrence Hopkinson, Seattle; Milwaukee Medical College, 1897; formerly professor of gastroenterology at his alma mater; served during the World War; aged 75; died, September 8, in the United States Marine Hospital of coronary occlusion.

Edgar Mayer Johnson, New Haven, Conn.; Yale University School of Medicine, New Haven, 1914; member of the Connecticut State Medical Society; a medical examiner for a draft board; aged 55; died, October 1, of coronary thrombosis.

Moritz Fredrick Petersen, Charleston, W. Va.; Northwestern University Medical School, Chicago, 1921; member of the West Virginia State Medical Association; aged 48; died, October 1, at Rockford, Ill., of a self-inflicted bullet wound.

Frank Roland Coe, Warners, N. Y.; University of the City of New York Medical Department, New York, 1884; member of the Medical Society of the State of New York; aged 82; died, October 7, of uremia and arteriosclerosis.

George Michael Fitzgerald, Chicago; University of Illinois College of Medicine, Chicago, 1915; member of the Illinois State Medical Society; served during the World War; aged 50; died, September 29, of cerebral hemorrhage.

Silas L. Shaw, Clinton, La.; St. Louis College of Physicians and Surgeons, 1909; member of the Louisiana State Medical Society; coroner of East Feliciana Parish; aged 66; died, September 29, of coronary thrombosis.

Emilie H. Jones Barker, Sacramento, Calif.; New York Medical College and Hospital for Women, Homeopathic, New York, 1878; for many years resident physician to the Wellesley (Mass.) College; aged 100; died, October 8.

John H. Lowery, Donaldsville, La.; New Orleans University Medical College, 1894; aged 77; died, September 25, in the Flint Goodridge Hospital of Dillard University, New Orleans, of hypertrophy of the prostate.

William L. Doepp, Homewood, Ill.; Chicago Medical College, 1887; member of the Illinois State Medical Society; formerly school physician; aged 77; died, October 23, in Rockford of cerebral arteriosclerosis.

Charles Dudley Barksdale, Sutherlin, Va.; University of Virginia Department of Medicine, Charlottesville, 1895; formerly member of the county school board; aged 68; died, September 28, of coronary thrombosis.

Charles Clifford Archibald, Truro, N. S., Canada; Halifax Medical College, Halifax, N. S., 1902; served with the Royal Canadian Army Medical Corps; aged 63; died, September 6, in the Montreal General Hospital.

Charles Alfred Morris, Bakersfield, Calif.; College of Physicians and Surgeons of San Francisco, 1902; University and Bellevue Hospital Medical College, New York, 1909; aged 69; died, September 8.

Darius Augustus Coon, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1890; Queen's University Faculty of Medicine, Kingston, 1890; served during the World War; aged 79; died, September 29.

William Thomas Berry, Clinton, Ky.; St. Louis College of Physicians and Surgeons, 1901; member of the Kentucky State Medical Association; aged 78; died, September 30, of carcinoma of the stomach.

Charles Henry Barr, Canby, Ore.; University of Oregon Medical School, Portland, 1939; member of the Oregon State Medical Society; aged 33; died in October of injuries received in an automobile accident.

John L. Gandy, Hickory, Miss.; University of Tennessee Medical Department, Nashville, 1893; aged 73; died, September 28, in the Anderson Infirmary, Meridian, of myocarditis and chronic nephritis.

Royal G. Mundy, Washington, D. C.; Howard University College of Medicine, Washington, 1907; aged 58; died, September 5, in the Freedmen's Hospital of carbuncle of the neck and diabetes mellitus.

Edward Payson Atkinson, Oxford, N. S., Canada; Halifax (N. S.) Medical College, Halifax, 1899; aged 76; died, July 22, in the All Saints Hospital, Springhill, as the result of an automobile accident.

Fred J. Barnet, North Hollywood, Calif.; Albany (N. Y.) Medical College, 1908; served during the World War; aged 56; died, October 1, in the Veterans Administration Facility, West Los Angeles.

Frederick Clarke Stephenson, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1898; also a clergyman; aged 77; died, September 26, of injuries received when struck by an automobile.

George Francis Bracken, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; served during the World War; aged 63; died, October 23.

Frank P. Hanaphy, West Burlington, Iowa; State University of Iowa College of Medicine, Iowa City, 1888; aged

78; died, October 1, in the Mercy Hospital, Burlington, of arteriosclerosis.

Oscar Christian Carssow, Lewiston, Idaho; Marion-Sims College of Medicine, St. Louis, 1898; fellow of the American College of Surgeons; aged 62; died, August 17, of heart disease.

Thomas Dowling, Wilmington, Del.; Columbian University Medical Department, Washington, D. C., 1898; member of the Medical Society of District of Columbia; aged 72; died, September 24.

Joseph Mortimer Smith, Lynn, Mass.; Boston University School of Medicine, 1940; intern at the Carney Hospital, Boston; aged 29; was killed, September 13, in an airplane accident.

August Richard Wittke, Milwaukee; Milwaukee Medical College, 1898; aged 78; died, September 22, in St. Joseph's Hospital of cerebral hemorrhage, arteriosclerosis and diabetes mellitus.

Elbert Palmer Zeumer, Cincinnati; Eclectic Medical Institute, Cincinnati, 1899; member of the Ohio State Medical Association; aged 64; died, September 21, of coronary heart disease.

Jackson C. Strawn, Lyford, Texas; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1900; member of the State Medical Association of Texas; aged 66; died in September.

A. B. Smith, Snowville, Va. (licensed in Virginia in 1883); member of the Medical Society of Virginia; for many years a member of the county school board; aged 83; died, September 17.

Joseph Nathaniel Hunter, Rayland, Ohio; Medical Department of the University of Cincinnati, 1910; mayor of Rayland; aged 58; died, September 26, of carcinoma of the liver.

George Robert Lloyd Ireland, Bengough, Sask., Canada; Manitoba Medical College, Winnipeg, 1909; for many years chairman of the school board; aged 52; died, August 28.

William Horatio Browne, Romeo, Mich.; Detroit Homeopathic College, 1910; served during the World War; on the staff of the Romeo Hospital; aged 68; died, October 6.

Albert Berchmans Pavy, Opelousas, La.; University of Pennsylvania School of Medicine, Philadelphia, 1916; served during the World War; aged 52; died, September 21.

Joseph Earl Peden, Fredericksburg, Texas; Kentucky University Medical Department, Louisville, 1903; county health officer; aged 62; died, September 26, of heart disease.

George McKenzie Hall, Buffalo; University of Buffalo School of Medicine, 1901; served during the World War; aged 68; died, October 2, of coronary thrombosis.

William Sylvanus Hincks, Great Neck, N. Y.; New York Homeopathic Medical College, New York, 1884; aged 79; died, September 29, of gastric hemorrhage.

George H. Jones, Crescent, S. C.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1895; for many years postmaster; aged 72; died, September 27.

John Frank Atha, Austin, Texas; Lincoln (Neb.) Medical College of Coter University, 1907; aged 70; died, September 23, of vasomotor collapse.

Alfred Albert Lewin, Chicago; Chicago College of Medicine and Surgery, 1917; aged 67; died, October 8, of arteriosclerosis and heart disease.

Charles Giffin Pease, New York; New York Homeopathic Medical College and Hospital, New York, 1891; also a dentist; aged 87; died, October 7.

Lamont H. Fisher, Brooklyn; University and Bellevue Hospital Medical College, New York, 1912; aged 64; died, October 10.

William James Fredericks, Bradford, Pa.; Jefferson Medical College of Philadelphia, 1889; aged 76; died, September 24.

Frank Taylor Calef, North Providence, R. I.; Boston University School of Medicine, 1900; aged 65; died in September.

Dorman J. Clarke, Toledo, Ohio; Toledo Medical College, 1897; aged 72; died, September 29, of coronary occlusion.

Anna Mary Dorr Bryant, Littleton, Colo.; Tufts College Medical School, Boston, 1895; aged 84; died, August 16.

J. Eugenie Kerr, Shelby, Ohio (licensed in Ohio in 1896); aged 80; died, September 22, of cerebral hemorrhage.

Alexander Ross, Westville, N. S., Canada; Halifax (N. S.) Medical College, 1896; aged 80; died, August 27.

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," cosmetics or medical devices have agreed with the Federal Trade Commission to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Camp "reducing girdle"—This device was put out by an Abram R. Canter, trading as Surgical Appliance Company, Pittsburgh. According to a bulletin of the Federal Trade Commission, November 1940, Canter promised the Commission that he would drop from his advertising the words "Give Health" or any other similar implication which might give the impression that the wearing of this or other garments he put out would give or restore health where there is an unhealthy or diseased condition, and also to discontinue such statements as "You Don't Have To Be Fat" and "Reduce Your Waste And Hips With This Marvelous New Reducing Girdle" or the word "Reducing" in any way as descriptive of any of the garments so as to imply that they will reduce or eliminate fat, or cause the removal of local tissue from the waist or hips. Canter also promised to cease representing by the use of the word "Special" that any of these garments was offered at a special price when such was not the case.

Casa Anna Cosmetics—These were put out by a Gaetano Andronico and Anna Andronico of New York, who traded under the name Casa Anna. In November 1940 the Federal Trade Commission announced that these individuals had stipulated that in the advertising and sale of their cosmetic preparations (the names of which were not mentioned in the abstract) they would cease representing that the use of these products will nourish, protect or impart tone or tonicity to the skin or prevent, smooth or take away lines or wrinkles in the skin.

Cook's C C C—A C. and W. T. Stonestreet, trading as Sampson Medicine Company, Winston Salem, N. C., promised the Federal Trade Commission in January 1940 to cease representing that this product, or any other preparation containing substantially the same ingredients, is of remedial value in cases of kidney trouble, diarrhea, flux, ague, female weakness or cuts and burns or in any condition in which the skin is lacerated or that it is a remedy for any condition unless expressly limited to temporary symptomatic relief and then only when the symptoms may be relieved by use of a counterirritant for external conditions or a crinimative for internal conditions.

Danzola—In November 1940 the Federal Trade Commission announced that it had got the Hinton Pharmaceutical Company, London, Ky., to discontinue certain misrepresentations in the sale of this hair preparation. Among these were that Danzola or any similar product is a competent treatment or effective remedy for dandruff or will do more than temporarily remove loose dandruff scales, that it is a fine tonic for dandruff or other scalp ailment or will instantly relieve itching scalp, or has any remedial or tonic effect in scalp conditions or that its effects are guaranteed.

Frank & Seder Girdles—In November 1940 Frank and Seder of Philadelphia, Inc. stipulated with the Federal Trade Commission that in the sale of their girdles they would cease using the word "reducing" or other words of similar meaning, so as to give the impression that the wearing of such garments would cause a reduction in weight.

Hain Col Lax and Hain Colon Food—Harold Hain trading as the Hain Pure Food Company, Los Angeles, signed a stipulation with the Federal Trade Commission in January 1940 regarding these products promising to discontinue certain misrepresentations. Among these were that the Hain Col Lax is a laxative food or a natural laxative or that it will effect a change in intestinal flora or is efficacious or harmless in all cases of intestinal disorders, that Hain Col Lax will do more than relieve constipation, or that the use of Hain Colon Food will completely eliminate putrefaction or clear the blood stream of toxic wastes and regulate the entire system. In November 1938 Hain was prosecuted and fined for violating the Pure Food and Drugs Act in fraudulently labeling another product, 'Hain Vegetable Accessory Reducing Food'. This case was briefly reported in *The Journal* April 1, 1939, page 1279.

Hot Drops—This is put out by a William Orland, trading as Hot Drops Company, Philadelphia. In April 1940 Orland promised the Federal Trade Commission that he would cease advertising that the product is a competent remedy or effective treatment for coughs or sore throat that it has any therapeutic value in treating such ailments in excess of providing a temporary palliative relief for some of the symptoms commonly encountered in colds and that it gives lasting relief.

Iod Ise—The Iod Ise Manufacturing Company, Inc. of Clifton, N. J., promised the Federal Trade Commission in February 1940 that it would cease representing that 'Iod Ise' is an 'iodine' corn remover or an

'iodine' discovery or preparation, that the product "ends" or "stops" soreness or pain, will afford permanent relief, will rid one of corns or prevent their return, or that the product heals tissue. The concern also agreed to cease representing that the actual removal of corns is due in any way to the iodine content of this product.

Lane Bryant, Inc., and Newman Cloak & Suit Company—These appear to be two names for one New York concern which puts out 'reducing' garments. In November 1940 the Lane Bryant Newman people signed a stipulation with the Federal Trade Commission agreeing to eliminate from their advertising the words "reduce" or "reducing" or similar words, as descriptive of garments or of the fabric of which they are made, to imply that the use of them will reduce fat.

Lit's "reducing garments"—These consisted of girdles and corsets put out by Lit Bros of Philadelphia, who in November 1940 promised the Federal Trade Commission that in the advertising and sale of these garments they would eliminate the word "Reducing" or any similar expression implying that the wearing of such articles would effectively remove fat.

Medrex Ointment and Soap—A Martin A. Levitt puts out these products in the name of the William A. Reed Company, Philadelphia. In January 1940 the Federal Trade Commission announced that Levitt had stipulated that he would cease advertising that "Medrex Ointment," when used alone or in combination with "Medrex Soap," is an effective remedy for pimples in any manner other than as a relief for itching and, to a limited extent, as a skin antiseptic, fungicide and desiccant, that either product or both heal or clear the skin, that either or both constitute an effective remedy for blackheads, open pores, eczema or other skin conditions, and that Medrex Ointment penetrates below the surface of the skin or acts safely or without irritation.

Mme. Rubino's Cosmetics—The Rubino's Cosmetic Company, Inc., Cleveland, put out a number of these, including "Neck Cream," "Wrinkle Remover," "Acne Cream" and "Russian Herb Pack." In November 1940 the Rubino's people promised the Federal Trade Commission that they would cease representing any cosmetic preparation as a "tissue cream," a "tissue builder," a "food for the skin," a "rejuvenating cream" or a "nourishing cream or oil," or otherwise representing that any of its preparations externally applied affects the texture or cell structure of the skin, or imparts renewed vitality, or provides sustenance therefor, that it would stop using the term "Vitamin I" in connection with the name of any cosmetic product or as descriptive of inoleic or linoleic acid and cease representing that an external application of chemicals or ingredients will restore a healthy and youthful skin.

Moon Rose Complexion Soap—This was distributed by a Paul M. Cooter, trading as Cooter Brokerage Company, Chicago. In February 1941 the Federal Trade Commission reported that he had agreed to cease advertising that the soap reconditions or fortifies the skin, replaces the oils of the skin or stimulates its oil glands and causes the skin to breathe, that it penetrates the pores or has any effect on the skin other than to cleanse the surface, and that the use of it prevents blemishes, enhances beauty or causes one to look young.

Munter's Nulife—Under this name the Nulife Garments Corporation of New York sold a "health" belt and a shoulder brace. In November 1940 the Nulife concern promised the Federal Trade Commission that in its advertising of these devices it would discontinue certain misrepresentations, such as that they would correct congenital or acquired postural deformities, improve physical activity, increase vitality or store up physical energy throughout the entire body, straighten round shoulders instantly and permanently or so improve the wearer's posture in all cases as to make him 'look and feel like a West Pointer'.

Nova—A stipulation was signed in February 1941 by George A. Springstead, trading as Seneca Specialties, Geneva, N. Y., in which he promised the Federal Trade Commission that he would cease advertising that "Nova" will banish gray hair or impart the original color or exact shade desired and to discontinue the representation that the product will have more than a slight coloring action on the hair, that its use cannot be detected, or that it is blended or balanced according to a French formula.

Patten's Concentrates—These are put out by Patten Concentrates, Inc., of Burbank, Calif., and are said to consist of dehydrated vegetable products some of which are fortified with vitamins and others with drug laxatives. In February 1941 the concern stipulated with the Federal Trade Commission that it would discontinue certain misrepresentations in the advertising of its products. Among these were that it manufactures or produces these or that they are chemically or biologically assayed at frequent intervals, that they are "correctives" or have any special health giving or remedial value, that "Patten's Tablets Enriched with Vitamins A B D G" will maintain a person's physical fitness, that "Parsley Garlic Tablets" are an effective remedy for high blood pressure or hardening of the arteries or that "Ultra Eleven Vegetable Tablets" are an effective treatment for anemia, loss of weight, arthritis and malnutrition. The Patten concern further promised to cease representing that "Patten's Kelp Tablets" are harmless in all cases and to run no advertisements that fail to reveal that these tablets should not be used by persons with lung diseases, chronic cough, colitis or thyroid diseases, except on the advice of a physician, or any advertisements which fail to reveal that if a cutaneous rash appears the use of the preparation should be discontinued.

Psori Oil—This is put out from Huntington W. Va., by a Dr. D. R. Parsons, a dentist. Just why a dentist should presume to represent that he has a cure for psoriasis is not clear. The Federal Trade Commission objected to the misrepresentations in the advertising and announced in November 1940 that it had got Dr. Parsons to discontinue these. Among

them were that Psori Oil or any substantially similar mixture will "cure" or "rid" one of psoriasis, scaly skin diseases or any other skin or scalp affliction, or that it has been recommended or endorsed by "many physicians." Dr. Parsons also agreed to discontinue use of the trade name "Dr. D. R. Parsons" or any other representations which would imply that he is a physician or a doctor of medicine or is engaged in the practice of medicine, or to use the terms "Doctor" or "Dr." in his advertising without making it clear that he is a doctor of dentistry and not of medicine.

Quinlax Cold Tablets—The Vadsco Sales Corporation, New York, signed a stipulation with the Federal Trade Commission in January 1940 in which it agreed to discontinue the misrepresentation that these tablets are a competent or effective treatment to stimulate circulation or to eliminate acids through the pores, and that the preparation treats seven symptoms or phases of a cold, is a complete treatment or effective remedy for colds, a new preparation and a new method for treating colds or their symptoms, especially suitable for children.

Rahnous Products—These are put out by one E. W. Rahn, Cleveland, who in February 1941 promised the Federal Trade Commission to cease representing that "Rahnous Capsules," "Rahnous Nasal Drops No. 1" and "Rahnous Nasal Drops No. 2," alone or in combination, comprise a competent treatment for colds, hay fever, rose fever, asthma or catarrh, in excess of affording temporary relief from symptoms and discomforts associated with these conditions; that any of the products is a specific, and that Rahnous Capsules is of aid in building body resistance or that it regulates the body. A similar stipulation was signed in March 1941 by William Ganson Rose, Inc., a Cleveland agency which handles the Rahnous advertising.

Sal-Fayne—This was advertised to banish headaches, distress after over-indulgence, periodic or muscular pains, as an effective remedy for post-operative pains and as capable of stopping or preventing colds or the development of influenza, relieving mental or physical dullness and effectively treating the nerves. In February 1941 the Sal-Fayne Corporation, Dayton, Ohio, promised the Federal Trade Commission that it would withdraw these claims and would in the future publish no advertisements which fail to reveal that the frequent or continued use of its product may be dangerous, causing serious blood disturbances, and that no more than the dosage recommended should be taken.

Stuart's Laxative Compound Tablets—A stipulation was filed with the Federal Trade Commission in March 1941 by F. A. Stuart Company, Marshall, Mich., in which it agreed to cease representing that the product is invariably safe to use. It was also promised that no advertisements would be issued which fail to reveal that the use of the preparation should be discontinued if a skin rash appears, that it should not be used when abdominal pain, nausea, vomiting or other symptoms of appendicitis are present, and that frequent or continued use may result in dependence on laxatives. This stipulation was supplemental to one accepted by the Commission from the Stuart concern in December 1936. In May 1941 Benson & Dall, Inc., Chicago, which handles the Stuart advertising, signed a similar stipulation.

Thoxine—This is put out by The Reese Chemical Company, Cleveland, which in March 1941 stipulated with the Federal Trade Commission that it would discontinue the following misrepresentations in its advertising: That the product is a remedy or cure for sore throat or has any value in that condition beyond affording temporary relief for certain aches and discomforts that accompany colds, that "Thoxine" soothes congested membranes all the way down or works quickly through the entire system, and that it is the ideal preparation for children. This stipulation was supplemental to one accepted by the Commission in May 1936 in which The Reese Chemical Company agreed to cease making other misrepresentations about Thoxine.

Vac-U-Massage Cup—This device, put out by H. S. Bird, trading as Anthony Brice, is also known as "Vacu Bell No. 1" and "Vac Bell No. 2." In August 1940 Bird signed a stipulation with the Federal Trade Commission agreeing to cease representing that the thing enables one to massage all parts of the scalp, is a competent remedy or effective treatment for baldness or falling hair; has any therapeutic value in excess of a massage medium resulting in increased cutaneous circulation, or aids in the removal of surplus fat from the body.

Vesta "reducing garments"—These were promoted by a Frederick A. Purchas and a Carl D. Hammond, trading as Vesta Corset Company, McGraw, N. Y. In November 1940 the Federal Trade Commission reported that these individuals had agreed that in the sale of their girdles, combinations and corsets they would cease using the word "reducing" or other words of similar meaning which would imply that the wearing of such garments would cause a reduction of local or body tissue or effectively remove fat.

Vitey Perles—H. Pierce Weller, trading as Weller Company, Atascadero, Calif., signed a stipulation in March 1941 with the Federal Trade Commission in which he promised to cease representing that his product stimulates sexual desire or ability, increases energy or has any effect whatever, without expressly limiting such claims to cases in which there is a lack of vitamin E.

Zymol Trokeys—The Consolidated Royal Chemical Corporation and Benson and Dall, Inc., both of Chicago, the latter an advertising agency, entered into stipulations with the Federal Trade Commission in March 1941 in which they agreed to discontinue misrepresentations in promoting this medicated lozenge. Each agreed to cease advertising that the product will go twice as far as cough syrup at half the cost, that it constitutes a new way to relief and that the syrupy solution obtained by melting the product in water will be beneficial to children suffering from croup.

Correspondence

DURAN-REYNALS "SPREADING FACTOR"

To the Editor:—The editorial on Duran-Reynals "spreading factor" (*THE JOURNAL*, September 27, p. 1099) might be misleading in regard to the history of this subject.

The mucopolysaccharide of vitreous humor was isolated and characterized by Meyer and Palmer in 1936 (*J. Biol. Chem.* **114**:689 [July] 1936) and called hyaluronic acid. The mucopolysaccharide of synovial fluid likewise was isolated and characterized as hyaluronic acid in my laboratory (*Science* **88**:129 [Aug. 5] 1938; *J. Biol. Chem.* **128**:319 [April] 1939).

Enzymes of bacterial and animal origin, which hydrolyzed specifically hyaluronic acid and depolymerized viscous fluids containing hyaluronic acid as their viscous components, were also first demonstrated by us before the correlation between "spreading factor" and hyaluronidase was recognized by Chain and Duthie in their remarkable paper (*Proc. Soc. Exper. Biol. & Med.* **34**:816 [June] 1936; *J. Biol. Chem.* **118**:71 [March] 1937; *J. Exper. Med.* **71**:137 [Feb.] 1940).

Furthermore, as far as I am aware, proof of the existence of hyaluronic acid in the skin was furnished only by Meyer and Chaffee by the isolation of hyaluronic acid from skin (*J. Biol. Chem.* **138**:491 [April] 1941). A viscous "mucoid" in skin similar to that obtained by the English authors had been described as early as 1909.

KARL MEYER, M.D., PH.D.,
Columbia University Department
of Ophthalmology Research,
New York.

CAROTID SINUS SYNCOPE

To the Editor:—Your editorial (*THE JOURNAL*, October 4, p. 1185) on carotid sinus syncope was timely. The syndrome is not at all rare and can be diagnosed by any physician interested in looking for it.

I have seen several active cases in the past year. An electrocardiogram taken on 1 of these patients while pressure was made on the right carotid sinus shows complete cardiac asystole of over seven seconds, then a ventricular escape; another period of asystole of about three seconds and a ventricular escape; then a period of asystole of three seconds and complete systole which is preceded by syncope and convulsive seizure.

If one has the assistant mark the electrocardiogram as soon as pressure is made, one notes that the response is immediate, usually less than two tenths of a second. I have fortunately not had any serious effects as a result of pressure on the sensitive carotid sinus, but my last patient did vomit all day as a result of the pressure and did not feel like himself till the next day.

I have long felt that some of these sudden so-called anesthesia deaths on the operating table, which in the past have not been attributable to any definite cause, may be due to the anesthetist's making pressure unknowingly on the sensitive carotid sinus of these persons. I visualize a real calamity if, unknowingly, pressure is made simultaneously on the two carotid sinuses of a sensitive person. The retraction of the head alone may in some cases stimulate the sensitive carotid sinus. May it not also be that the anesthesia plus the sensitive carotid sinus would cause disastrous results?

Most of us at one time or another have seen the terrible calamity of a patient on the operating table, just as he takes a few whiffs of the anesthetic, die suddenly. Was it anesthesia or was it a long asystole or a severe drop in blood pressure due to a sensitive carotid sinus that caused the sudden death?

L. H. LANDAY, M.D., Pittsburgh.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE
CHICAGO, Feb. 16-17, 1942. Council on Medical Education and Hospi-
tals, Sec., Dr. William D. Cutter, 535 North Dearborn Street, Chicago.

MEDICAL CORPS, UNITED STATES NAVY

Examination. Assistant Surgeon with the permanent rank of Lieutenant
(junior grade) and Acting Assistant Surgeon with the probationary rank
of Lieutenant (junior grade), Jan. 5-9. Examination will be held at the
Naval Hospitals at Chelsea, Mass., Newport, R. I., Brooklyn, Philadelphia,
Norfolk, Va., Charleston, S. C., Pensacola, Fla., Corpus Christi, Tex.,
San Diego and Mare Island, Calif., Puget Sound, Wash., Great Lakes,
Ill., Pearl Harbor, T. H., and Naval Medical Center, Washington, D. C.
Apply Bureau of Medicine and Surgery, Navy Department, Washington,
D. C.

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners
in the basic sciences were published in THE JOURNAL, November 8, page
1644.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various
centers, Feb. 9-11. Part III. Boston, November. Exec. Sec., Mr.
Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written. Part I.* Various
centers, March 31. Final date for filing application is Dec. 31. Sec., Dr.
Paul M. Wood, 745 Fifth Ave., New York City.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* April in advance
of the meeting of the American College of Physicians and June, in
advance of the meeting of the American Medical Association. Applications
should be on file 6 weeks in advance of the date of oral examination.
Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: New York, June.
Sec., Dr. R. Glen Spurling, 404 Brown Bldg., Louisville.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written. Part I.*
Group B. Various centers, Jan. 3. *Oral. Part II. Groups A and B*
Atlantic City, May or June. Final date for filing application is March 1.
Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* March 7. Final
date for filing application is Dec. 1. Sec., Dr. John Green, 6830 Water-
man Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Atlantic City, Jan. 9-10.
Sec. Dr. Guy A. Caldwell, 3503 Prytania St., New Orleans.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral and Written. All*
Groups. Philadelphia, June, preceding the meeting of the American
Medical Association. Final date for filing application is March 1. Sec.,
Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha, Neb.

AMERICAN BOARD OF PATHOLOGY: St. Louis, March 30-31. Final date
for filing application is Jan. 30. Sec., Dr. F. W. Hartman, Henry Ford
Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Philadelphia, March 30-31,
preceding the Region I meeting of the American Academy of Pediatrics.
Los Angeles, April 22, preceding the Region IV meeting of the American
Academy of Pediatrics. Cleveland, May 13, preceding the Region III
meeting of the American Academy of Pediatrics. *Written.* Locally,
February 14. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF RADIOLOGY: *Oral. All Groups.* Atlantic City,
June 4. Final date for filing application is April 1. Sec., Dr. Byrl R.
Kirklin, 102-110 Second Ave., S. W., Rochester, Minn.

AMERICAN BOARD OF UROLOGY: *Written.* Various centers, December.
Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Delaware July Report

The Delaware State Board of Medical Examiners and
Homeopathic Board of Examiners reports the written exami-
nation for medical licensure held at Dover, July 8-10, 1941.
The examination covered 10 subjects and included 100 questions.
An average of 75 per cent in each subject was required to pass.
Eighteen candidates were examined, all of whom passed. One
physician was licensed to practice medicine by reciprocity. The
following schools were represented:

School	PASSED	Year Grad.	Number Passed
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1938), (1940)		2
Wayne University College of Medicine.....	(1940)		1
Cornell University Medical College.....	(1938)		1
Hahnemann Medical College and Hospital of Philadelphia.....	(1940), (2)		2
Jefferson Medical College of Philadelphia....	(1932), (1937), (1938), (1939), (1940, 4)		8
Temple University School of Medicine.....	(1940, 2)		2
University of Pennsylvania School of Medicine.....	(1940)		1
University of Virginia Department of Medicine.....	(1940)		1
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Albany Medical College.....		(1900)	New York

North Dakota July Report

The North Dakota State Board of Medical Examiners reports the written examination for medical licensure held at Grand Forks, July 1-3, 1941. Nine candidates were examined, all of whom passed. Two physicians were licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
University of Arkansas School of Medicine.....	(1940)		1
College of Medical Evangelists.....	(1941)		1
Northwestern University Medical School.....	(1940), (1941)		2
The School of Medicine of the Division of the Biological Sciences	(1935)		1
University of Michigan Medical School.....	(1939)		1
University of Minnesota Medical School.....	(1939), (1941, 2)		3
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
The School of Medicine of the Division of the Bio-logical Sciences	(1937)		Wisconsin
University of Michigan Medical School.....	(1937)		Michigan
School	LICENSED BY ENDORSEMENT	Year Grad.	
Harvard Medical School.....	(1939)		

Arizona July Report

The Arizona State Board of Medical Examiners reports the written examination for medical licensure held at Phoenix, July 2-3, 1941. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Seven candidates were examined, all of whom passed. Four physicians were licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	
College of Medical Evangelists.....	(1941)		
Rush Medical College.....	(1940)		
State University of Iowa College of Medicine.....	(1940)		
Tulane University of Louisiana School of Medicine.....	(1940)		
St. Louis University School of Medicine.....	(1939)		
University of Wisconsin Medical School.....	(1940)		
McGill University Faculty of Medicine.....	(1940)		
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine.....	(1931)		Arkansas
University of Illinois College of Medicine.....	(1931)		Missouri
Eclectic Medical College, Cincinnati.....			Ohio
Licentiate of the Royal College of Surgeons.....			New York
Royal Faculty of Physicians.....			
School	LICENSED BY ENDORSEMENT	Year Grad.	
University of Rochester School of Medicine and Dentistry.....	(1931)		

Arkansas June Report

The Arkansas State Board of Medical Examiners reports the written examination for medical licensure held at Little Rock, June 5-6, 1941. The examination covered 12 subjects. An average of 70 per cent was required to pass. Sixty candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
University of Arkansas School of Medicine.....	(1941)		60
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Alabama School of Medicine.....	(1916)		Alabama
Tufts College Medical School.....	(1938)		Maine
University of Minnesota Medical School.....	(1940)		Minnesota
University of Nebraska College of Medicine.....	(1924)		Nebraska
University of Oklahoma School of Medicine.....	(1939)		Oklahoma
Meharry Medical College.....	(1939)		Tennessee
University of Tennessee College of Medicine.....	(1914)		Oklahoma,
(1938), (1939) Tennessee			
Medical College of Virginia	(1920)		N. Carolina
School	LICENSED BY ENDORSEMENT	Year Grad.	
Yale University School of Medicine.....	(1937)		

Iowa Reciprocity Report

The Iowa State Board of Medical Examiners reports 21 physicians licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners from April 4 through August 25. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School.....	(1938)	(1938)	Minnesota
Rush Medical College.....	(1906), (1931)	(1931)	Illinois
University of Kansas School of Medicine.....	(1940)	(1940)	Kansas
Tulane University of Louisiana School of Medicine.....	(1935)	(1935)	Louisiana
University of Michigan Medical School.....	(1939)	(1939)	Michigan
University of Minnesota Medical School.....	(1941)	(1941)	Minnesota
Washington University School of Medicine.....	(1931)	(1931)	Missouri
Creighton University School of Medicine.....	(1935), (1940)	(1940)	Nebraska
University of Nebraska College of Medicine.....	(1924), (1940), (2)	(1940)	Nebraska
Western Reserve University School of Medicine.....	(1933)	(1933)	Ohio
University of Pennsylvania School of Medicine.....	(1937)	(1937)	Penna.
University of Wisconsin Medical School.....	(1937)	(1937)	Wisconsin
Medizinische Fakultät der Universität Wien.....	(1918)	(1918)	Wisconsin
(1929) New York, (1930) California			
Regia Università degli Studi di Bologna. Facoltà di			
Medicina e Chirurgia.....	(1937)	(1937)	New York
Universität Basel Medizinische Fakultät.....	(1934)	(1934)	New Jersey

School	LICENSED BY ENDORSEMENT	Year Grad.
State University of Iowa College of Medicine.....	(1940)	(1940)
University of Vermont College of Medicine.....	(1935)	(1935)

Missouri Reciprocity Report

The State Board of Health of Missouri reports 9 physicians licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners on August 15. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine.....	(1940)	(1940)	Arkansas
State University of Iowa College of Medicine.....	(1939)	(1939)	Iowa
University of Kansas School of Medicine.....	(1939), (1940)	(1940)	Kansas
University of Louisville School of Medicine.....	(1940)	(1940)	Kentucky
Columbia University College of Physicians and Surgeons.....	(1931)	(1931)	New York
University of Rochester School of Medicine and Dentistry.....	(1940)	(1940)	New York
Meharry Medical College.....	(1939)	(1939)	Tennessee
University of Tennessee College of Medicine.....	(1937)	(1937)	Tennessee

School	LICENSED BY ENDORSEMENT	Year Grad.
Washington University School of Medicine.....	(1937)	(1937)

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Death from Coronary Thrombosis Allegedly Caused by Embolism Resulting from Laceration of Hand.—In the course of his employment on July 16, 1937, Swalm slipped and fell on two bottles of milk, "causing laceration of left hand, ring finger, and slight laceration of left thumb." He was disabled for about forty days and then returned to work apparently normal except that the lacerations left "a scar on his left hand diagonally, right to left, between the base of the left ring finger toward the thumb about 1 inch to 1½ inches long." The scar was tender and became swollen. The workman complained of pain around the scar and was unable to flex his left ring finger. Nevertheless, he worked regularly after his return to work until the day before his death, "which occurred quite suddenly on Jan. 12, 1938, from a coronary thrombosis." His widow instituted proceedings for compensation under the Workmen's Compensation Act of Pennsylvania, claiming a causal relation between the industrial accident and the death on the theory that "an embolus, originating in the injured hand . . . had passed through the venous system into the right side of his heart and thence through the lungs into the left side and through the aorta into a coronary artery where a fatal coronary thrombosis occurred." The referee before whom the hearing on the widow's claim was

held denied compensation, but the workmen's compensation board, on appeal, found a causal relation between the death and the industrial accident and awarded compensation. The court of common pleas, Schuylkill County, however, reversed the board's decision and the widow appealed to the superior court of Pennsylvania.

The question before the superior court was whether or not competent and substantial medical testimony had been adduced at the hearing to support the finding by the workmen's compensation board that there was a causal connection between the industrial accident and the death. In support of her contention, the widow produced two physician witnesses. One witness, Dr. McGurl, who had given the decedent "temporary treatment" following the industrial accident, testified that in his opinion the death had resulted from coronary occlusion, but as to the source of the substance which caused the artery to occlude he testified merely that it was possible that it came from the injured hand. In the opinion of the court the testimony of this witness was clearly insufficient to support an award. The other physician called by the claimant, Dr. Biddle, had been the decedent's family physician for years and had been consulted by the workman several weeks prior to his death relative to the condition of his hand at the site of the accidental injury. As to the cause of death, this physician stated:

I find there was nothing he complained of, he complained of nothing excepting this left hand, no shortness of breath that I found out from any of his relatives, so that the only conclusion I could come to it must have been an embolism.

The physician further stated that the embolism, which was the cause of the death, came from the injured hand. As the basis for this conclusion the physician restated that, since the workman complained of nothing except the wound which followed the industrial accident, "therefore, the wound was sufficient enough to cause the formation of a thrombus and this thrombus could get loose in time." In the opinion of the court, the testimony of this physician amounted to a positive statement that in his professional opinion the death resulted from an embolus which in turn was caused by the industrial accident. Three physicians were called by the employer, all of whom were of the opinion that it would be impossible for an embolus to be formed in the veins in the palm of the workman's hand and pass through his lungs into a coronary artery. However, the court believed that the credibility of medical witnesses and the weight to be attached to the testimony of each of them were matters exclusively for the determination of the workmen's compensation board and that where any conflicts appeared in their theories or opinions it was for the board to decide which conclusion it would adopt. The court therefore considered itself bound by the finding of the board adopting the theory and conclusions of Dr. Biddle, which in the opinion of the court were sufficient in quality to sustain the award made by the board.

Accordingly, the award of compensation to the widow was affirmed.—*Swalm v. J. H. Brokhoff, Inc.*, 20 A. 2d. 797 (Pa., 1941).

Society Proceedings

COMING MEETINGS

- National Society for the Prevention of Blindness, New York, Dec. 4-6. Mrs. Eleanor Brown Merrill, 1790 Broadway, New York, Executive Director.
- Puerto Rico, Medical Association of, Santurce, Dec. 11-14. Dr. David E. Garcia, P. O. Box 3866, Santurce, Secretary.
- Radiological Society of North America, San Francisco, Dec. 1-5. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, New York, Dec. 6. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Society of American Bacteriologists, Baltimore, Dec. 29-31. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Southern Surgical Association, Pinehurst, N. C., Dec. 9-11. Dr. E. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
- Southwestern Medical Association, El Paso, Texas, Nov. 20-22. Dr. Louis W. Breck, 116 Mills St., El Paso, Secretary.
- Western Surgical Association, St. Paul, Dec. 5-6. Dr. Arthur R. Meitz, 2449 Washington Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

202:313-468 (Sept.) 1941

- Unusual Symptomatology with Tumors of Cerebellum Based on 158 Verified Cases. F. C. Grant, J. E. Webster and L. M. Weinberger, Philadelphia.—p. 313.
- Cerebrospinal Fluid Protein Values Determined by Tyrosine Equivalent Method. T. U. Marron, Des Moines, Iowa.—p. 330.
- Cretin's Response to Typhoid Inoculation. Nell Hirschberg and I. P. Bronstein, Chicago.—p. 333.
- Modification of Resistance to Anoxia, with Special Reference to High Altitude Flying. A. L. Barach, M. Eckman and N. Molomut, New York.—p. 336.
- Sternal Marrow Changes During First Week of Life: Correlation with Peripheral Blood Findings. L. M. Shapiro and F. A. Bassen, New York.—p. 341.
- *Effect of Topical Application of 2-Methyl-1,4-Naphthoquinone (Synthetic Vitamin K Analogue) on Prothrombin Level of Newborn Infants, with Reference to Simplified Microprothrombin Test. H. K. Russell and R. C. Page, New York.—p. 355.
- Effectiveness of Prenatal Administration of 2-Methyl-1,4-Naphthoquinone in Maintaining Normal Prothrombin Levels in Infants. Eleanor H. Valentine, J. G. Reinhold, Philadelphia, and E. Schneider, New York.—p. 359.
- *Peripheral Circulatory Failure in Diabetic Acidosis and Its Relation to Treatment. A. E. Schechter, B. H. Wiesel and C. Cohn, Philadelphia.—p. 364.
- *Results of Sulfocyanate Therapy in Hypertension. C. M. Kurtz, H. H. Shapiro and C. S. Mills, Madison, Wis.—p. 378.
- Congenital Heart Disease During Pregnancy. C. L. Mendelson and H. E. B. Pardee, New York.—p. 392.
- Pregnancy and Development of Mammary Cancer. J. Scapier, Algiers, North Africa.—p. 402.
- *Concentrated Liver Extract in Maintenance Treatment of Pernicious Anemia. T. S. Evans and R. H. Jordan, New Haven, Conn.—p. 408.
- Viability of Spirochetes of Syphilis and Yaws in Desiccated Blood Serum. T. B. Turner, J. H. Bauer and F. C. Kluth, Baltimore.—p. 416.
- Autopsy Survey of Gastroduodenal Ulcers in Philadelphia General Hospital 1920-1937. J. S. Gordon Jr., Chicago, and J. J. Manning, Wauwatosa, Wis.—p. 423.
- Use of 2-Sulfanilamidopyrazine in Pneumococcal Pneumonia: Preliminary Report. J. M. Rueggesser, M. Hamburger Jr., Cincinnati; A. S. Turk, Birmingham, Ala.; T. D. Spies and M. A. Blankenhorn, Cincinnati.—p. 432.
- Capillaries in Myxedema. H. Zondek, M. Michael and A. Kaatz, Jerusalem, Palestine.—p. 435.

Prothrombin Level of Newborn Infants.—Russell and Page applied vitamin K locally to half of 48 newborn infants: 10 mg. of menadione in an ointment base was applied topically to the back during the first or second day following birth. Typical physiologic hypoprothrombinemia of the newborn was exhibited in 18 of the 24 control infants. The treated group did not show any increase in prothrombin coagulation time. The prothrombin coagulation time showed a steady decrease and was within normal limits by the fifth day. No treated newborn infants exhibited the so-called physiologic hypoprothrombinemia. As this method is simple and effective the authors suggest that the single application be used routinely as a prophylactic measure. They describe a simplified microprothrombin test which makes use of a stable thromboplastic substance: Russell viper venom. The test requires no special apparatus or unstable reagents and can be performed by the practitioner at the bedside.

Circulatory Failure in Diabetic Acidosis.—Since treated patients with uncomplicated diabetic acidosis often die and postmortem examination yields little evidence as to the cause of death, Schechter and his associates looked for a disturbance of function sufficient to cause death and yet not leave diagnostic postmortem changes such as "medical shock" and peripheral circulatory failure. The peripheral blood flow of the 8 patients discussed was reduced. Blood flow increased during treatment

and was most definite when the speed of intravenous infusion was increased. Determinations of oxygen content of arterial and venous blood showed a narrow difference between the two specimens. Venous oxygen saturation was high in the presence of reduced blood flow. Estimations of oxygen utilization can be calculated from arteriovenous oxygen difference (1 cc. of oxygen per hundred cubic centimeters of blood) and blood flow (expressed as cubic centimeters of blood per hundred cubic centimeters of hand). The data suggest that oxygen utilization is reduced in untreated diabetic acidosis. The patients with the most definite decreases were semiconscious or unconscious; those with less marked reductions were conscious. Treatment seemed to be accompanied by an increase in oxygen utilization. The possible causes for failure of oxygen utilization are inability to utilize carbohydrate, ketosis or acidosis. Blood pressure was reduced in all patients on admission. The degree of reduction varied with the seriousness of the illness. Initial serum proteins, hemoglobin and cell volumes were above recovery levels in all cases, indicating the severity of dehydration. Serum protein concentrations decreased after parenteral fluid therapy. Hemoglobin values fell during hydration, after which the levels were maintained. Cell volume by hematocrit paralleled the hemoglobin changes. However, patients in diabetic acidosis differ from those in surgical shock with respect to the level of their venous oxygen saturation in the presence of definitely reduced blood flows. Similar reductions of peripheral blood flow were found in surgical shock as were found in patients with diabetic acidosis. Venous blood leaving such regions of reduced blood flow showed little oxygen unsaturation. The reduced peripheral blood flow indicated the reduction in the speed of hemoglobin bringing oxygen to the tissues. The high venous oxygen saturation suggests that hemoglobin fails to liberate its oxygen to the tissues or that the tissues fail to remove the liberated oxygen. These observations point to the existence of a histotoxic as well as a stagnant anoxia in the peripheral circulatory failure of diabetic acidosis.

Thiocyanate Therapy in Hypertension.—Kurtz and his co-workers used Barker's method for determining the blood cyanates as a laboratory therapeutic control while treating 50 hypertensive patients with potassium thiocyanate. Every patient was observed for at least three months and many for one or more years. Potassium thiocyanate therapy was not begun until after the arterial tension had become relatively stabilized. The drug was administered in an aqueous solution containing 5 grains (0.32 Gm.) to the drachm and the patient started on a dose of 1 drachm (5 grains) two or three times a day. The blood cyanate was determined weekly and the initial dose continued until the therapeutic level of from 6 to 12 mg. of blood cyanate per hundred cubic centimeters of blood was reached. The amount was then reduced and a maintenance dosage was determined for each patient so that the blood cyanate was kept within the level which appeared to produce the optimal blood pressure response. No attempt was made to force an excessively high blood pressure down to normal, but only to reduce the tension below the danger level and thus to relieve the strain on the heart, kidneys and cerebral vessels. Subjective improvement as estimated by the disappearance of headaches, dizziness, tinnitus and the like was definite in 63, fair in 20 and disappointing in 17 per cent. Six patients exhibited poor tolerance for cyanate. This was evidenced by precordial pain in 1, cutaneous rash in 3 and cutaneous rash and loss of hair in 2. There were 2 other patients who felt worse while under treatment. One of these was apparently extremely sensitive to thiocyanate and treatment was abandoned because of mental confusion and physical collapse. The blood pressure of every patient was somewhat reduced, and objective results were considered satisfactory in 78, fair in 16 and poor in 6 per cent. The average systolic pressure for the entire group dropped from 197 before treatment to 156 with treatment, while the average diastolic pressure dropped from 115 to 94. The blood pressure of 4 patients remained normal for months or years after thiocyanate was discontinued. The optimal blood cyanate level ranged from 4 to 16 mg. per hundred cubic centimeters with an average of 8.3 mg. The number of maintenance doses (5 grain) varied from three to twenty-one per week. The average was nine doses. During the eleven years these patients were observed, 4 died of heart failure, 4 of cerebral hemorrhage, 1 of coronary

occlusion and 2 of pneumonia. Death was never due to the cyanate therapy. The authors regard potassium thiocyanate as a valuable drug in the treatment of hypertension and, properly employed, capable of prolonging life and preventing disability in a substantial percentage of such patients. The drug can be safely administered provided proper laboratory control is always exercised.

Liver Extract in Pernicious Anemia.—Evans and Jordan state that 40 patients with proved pernicious anemia have been maintained in a state of well being on a concentrated liver extract (reticulogen). Only 2 of the patients have been treated for only two years; the rest for three or more years. Control patients kept on a less concentrated form of extract have been followed over the same period. Further control is offered by 12 of the 40 patients who previously had been treated with oral preparations and 12 others with a less concentrated form of liver extract intramuscularly. Erythrocyte counts and the hemoglobin percentage were not as spectacular as those of Murphy and Howard, but they do compare favorably with the reports of others and with counts of the man or woman in average health in New Haven. Nearly all the patients have noticed maintenance of previous good health or actual improvement in well-being. Most of the patients continued at gainful occupations or were restored to usefulness. Six were not able to work at the onset of therapy and are still unable to do much. Eight were unable to work when treatment was begun but are now able to do so. Nearly every patient has gained weight and strength. The neurologic symptoms of 32 patients have improved, 4 have shown no improvement and 4 did not complain of any neurologic symptoms at the onset of treatment. Twenty-one patients have shown improvement in gait; 2 of these patients were bedridden when treatment was instituted and are now able to walk. The vibratory sense of 11 patients was retained; 21 have regained some portion of it. Thirteen patients with relatively normal reflexes have retained them, and improvement has been noticed in 17 whose reflexes were absent at the onset of therapy. During therapy 3 patients regained a considerable amount of urinary sphincter control. The mentality and cooperativeness of practically every patient has improved. The patients whose anemias were complicated by chronic (arteriosclerosis, gallbladder disease, myxedema) and acute (respiratory disease, "grip," "influenza" and pneumonia) diseases responded as well as the average patient under similar circumstances. The cost of the preparation is not prohibitive and is more easily administered than less concentrated preparations.

American Journal of Surgery, New York

53:391-622 (Sept.) 1941

- Perforations of Intestine by Ingested Foreign Bodies: Report of Two Cases and Review of Literature. J. E. Macmannus, Cooperstown, N. Y.—p. 393.
- Fractional Spinal Anesthesia. M. J. Nicholson, U. H. Eversole and L. V. Hand, Boston.—p. 403.
- Malignancy of Vulva. L. W. Frank and A. J. Miller, Louisville, Ky.—p. 412.
- Surgery in Patients over 30 with Obstructing Pyloric Lesions. G. A. Carlucci, New York.—p. 417.
- Treatment of Large Hydroceles by Injection of Sodium Morrhuate. J. P. Robertson, Birmingham, Ala.—p. 421.
- Submucous Method in Treatment of Anorectal Diseases. A. S. Calman, New York.—p. 428.
- Use of Sulfhydryl Solution in Treatment of Burns: Preliminary Report. W. F. Pierce, Los Angeles.—p. 434.
- Embolie Vascular Accidents of Extremities. B. H. Brunkow, Billings, Mont.—p. 440.
- Osteopetrosis: Four Cases in One Family. N. L. Higinbotham and S. F. Alexander, New York.—p. 444.
- End Results of Synovectomy of Knee Joint. R. K. Ghormley and D. M. Cameron, Rochester, Minn.—p. 453.
- New Method of Closed Reduction of Fracture of Lateral Condyle of Tibia. M. Dohelle, Pittsfield, Mass.—p. 460.
- Colostomy and Ileostomy: New Method. M. E. Steinberg, Portland, Ore.—p. 463.
- Iron as Therapeutic Supplement in Peptic Ulcer Therapy. I. Ehrenfeld, Passaic, N. J., and R. F. Wallace, New York.—p. 470.
- Secondary Operations on Biliary Tract. H. M. Clute, Boston.—p. 475.
- Amniotic Fluid (Amfetin) in Its Relation to Inflammation: Observations in Rabbit and Man. R. H. Rigdon and J. W. Warren, Memphis, Tenn.—p. 481.
- Symptoms and Signs of Metastatic Cancer. R. B. Phillips, Rochester, N. Y.—p. 486.
- Closure of Difficult Abdominal Incisions. A. J. Dalton, Champaign, Ill.—p. 490.

Am. J. of Syphilis, Gonorrhea and Ven. Dis., St. Louis

25:527-658 (Sept.) 1941

- *Syndrome of Milian's Erythema of Ninth Day: Report of Fifty-Four Cases. E. E. Peters, Baltimore.—p. 527.
- Observations on Untreated Patients with Gonococcal Infection and Those Receiving Chemotherapy. A. Cohn, B. A. Kornblith and A. Steer, New York.—p. 557.
- Quantitatively Titered Serologic Test in Early Syphilis and Its Response to Treatment. E. L. Crosby, Baltimore, and A. D. Campbell, Seattle.—p. 566.
- *Development of General Paresis Following Essentially Normal Spinal Fluid Findings: Report of Case. I. Kopp and H. C. Solomon, Boston.—p. 583.
- Autochemotherapy in Cases of Fixed Serologic Reactions with Negative Results. I. Kopp and H. C. Solomon, Boston.—p. 591.
- Sobisminol Solution and Water-Soluble Potassium Bismuth Tartrate by Oral and Intramuscular Administration in Treatment of Experimental Rabbit Syphilis. J. A. Kolmer, H. Brown and Anna M. Rule, Philadelphia.—p. 595.
- Short Term Intensive Arsenotherapy of Early Syphilis: Preliminary Report. A. Schoch and L. J. Alexander, Dallas, Texas.—p. 607.
- Hemorrhagic Encephalitis Following Sulfarsphenamine: Report of Two Cases in Children. C. F. Friedman and M. A. Shinefeld, Brooklyn.—p. 610.
- Rare Ocular Reactions to Tryparsamide. S. E. C. Turvey, Vancouver, B. C., Canada.—p. 623.
- Solusilarsan (3,4'-Diacetylaminio-4-Hydroxy-Arsenobenzene-2'-Sodium Glycolate) in Treatment of Early Syphilis, with Some Observations on Rate of Fall of Serum Reagin. R. D. Hahn, Baltimore.—p. 628.

Syndrome of Milian's Erythema.—Peters reports 54 cases of erythema of the ninth day. Thirty-six of the patients were hospitalized and thoroughly studied at the time of the erythema. Most of the patients were moderately or acutely ill and more than 75 per cent complained of prodromal symptoms consisting of malaise, fever, anorexia, nausea and vomiting. Other prominent symptoms were headache, chills, itching, generalized aching in bones, muscles, joints and back and sore throat. The onset of the prodromes was usually abrupt and occurred between the fifth and the nineteenth day after the first injection of an arsphenamine and frequently within a few hours after the second or third injection. By the next day these symptoms were usually followed by the typical generalized rash. Examination revealed that the lymph nodes of 76 per cent of the patients were enlarged, the cervical nodes of 73 per cent and that 63 per cent presented exudative tonsillar hypertrophy. Hepatomegaly occurred in 9, jaundice in 7 and splenomegaly in 3 patients. Two patients showed renal involvement with albumin, hyaline and granular casts and erythrocytes in the urine. The average duration of the syndrome was six days. In 50 per cent the prodrome and erythema occurred on the same day. Of the patients, 52 had syphilis and 63 per cent were in the early infectious stages and 36 per cent had late, late latent or congenital syphilis. The drugs producing the erythema were arsphenamine, neoarsphenamine, mapharsen and acetylglucarsenobenzene. There was no correlation between the size of the dose and the occurrence of the erythema. Delayed complications caused by further chemotherapy occurred in 53 per cent of 36 patients and consisted in all types of dermatitis, recurrent erythema, nitritoid reactions, fever, gastrointestinal reactions and intolerance to the usual trivalent arsenicals. Further arsenical therapy caused reactions to appear in 70 per cent of patients. Serious sequelae to treatment after erythema developed in 9 of 15 patients who had reactions to the arsenical drugs prior to erythema. In general, blood smears showed a shift to the left, and there was a mild leukopenia of the granulocytic series with a relative monocytosis or lymphocytosis. Forty-four per cent of the patients had an eosinophilia of 5 per cent or greater. Of this group 87.5 per cent had serious immediate manifestations, while only 35 per cent of the patients with eosinophilia of 0 to 4 per cent had reactions. Of the patients who received further arsenotherapy within two weeks of the prodrome 77 per cent had serious complications, while if treatment was given later than two weeks only 28 per cent had mild complications. There were 2 instances of infectious syphilitic relapse.

Dementia Paralytica.—Kopp and Solomon were able to tabulate the clinical, serologic and therapeutic course of a patient with early minimal spinal fluid involvement from the onset of syphilis to the development of dementia paralytica. The spinal fluid of the patient showed minimal changes when examined fourteen months after the primary lesion, and when it was examined twenty-two months later it was essentially

negative. Nevertheless, parenchymatous neurosyphilis developed and after a period of fourteen years, during which time he had fairly continuous antisyphilitic therapy, characteristic mental symptoms of dementia paralytica and typical spinal fluid were exhibited. The patient was 22 years of age when the primary lesion followed by secondary cutaneous manifestations occurred. He was then given fourteen intravenous (arsenical) and twenty-five intramuscular (mercury) treatments over nine and a half months. The Wassermann reaction became negative. At fourteen months the spinal fluid was normal with but one important exception, a leukocyte count of 22, indicating a meningeal reaction. Because of a moderately positive Wassermann reaction three months later, additional chemotherapy was given. The second spinal fluid examination, three years after the primary lesion and after thirty-three months of therapy, was negative except for a trace of albumin and a colloidal gold curve of 1222210000. After a probationary period of six months the Hinton reaction was negative on nine occasions. Ten months later without further treatment the Hinton reaction was positive and antisyphilitic treatment was reinstituted and was continued for nine years by various physicians and clinics. The significance of the serologic relapse was overlooked. This demands another spinal fluid test, which was not done until the patient's hospitalization in 1940. The development of parenchymatous neurosyphilis (tabes dorsalis and dementia paralytica) years after a negative spinal fluid has been reported only once before, by Meyerbach. Invasion of the central nervous system in early syphilis is said to occur in all patients. The absence of abnormal changes in the spinal fluid does not imply that localized meningeal or parenchymatous changes have not occurred. Arsphenamine, mercury and bismuth do not always prevent the development of neurosyphilis.

American Review of Tuberculosis, New York

44:255-376 (Sept.) 1941

- *Demonstration of Tubercle Bacilli by Fluorescence Microscopy. O. W. Richards, Buffalo; E. K. Kline and R. E. Leach, Olean, N. Y.—p. 255.
- *Detection of Tubercle Bacilli by Fluorescence Microscopy. E. Bogen, Olive View, Calif.—p. 267.
- Pulmonary Insufficiency: III. Cases Demonstrating Advanced Cardio-pulmonary Insufficiency Following Artificial Pneumothorax and Thoracoplasty. A. Courmand, D. W. Richards Jr. and H. C. Maier, New York.—p. 272.
- Oxygen Percentage in Pneumothorax and Pneumoperitoneum Gases: Evidence of Low Oxygen Tension in Tuberculous Tissues. H. Pugsley, Gravenhurst, Ont., Canada, with technical assistance of R. Benham.—p. 288.
- Allergy and Immunity: Analysis of Their Interdependence. E. Urbach and P. M. Gottlieb, Philadelphia.—p. 298.
- Inspissated Cavity. A. Shamaskin, Oteen, N. C.—p. 310.
- *Pneumoperitoneum Supplementing Phrenic Paralysis. A. B. Rilance and F. C. Warring Jr., Shelton, Conn.—p. 323.
- Control of Tuberculosis in Institution for Mentally Ill. S. S. Altschuler and L. J. Bailey, Detroit.—p. 335.
- Tuberculosis in Medical Students. H. L. Alt, E. E. Barth and A. A. Day, Chicago.—p. 346.
- Rehabilitation of the Tuberculous. L. E. Siltzbach, New York.—p. 357.

Fluorescence Microscopy.—According to Richards and his associates, the Cattaraugus County Laboratory has used the fluorescence microscopy in parallel with Ziehl-Neelsen stains on direct smears and concentration tests on 324 specimens of sputum. After the 87 positive by direct smears, which were not concentrated, and the 73 that were of insufficient quantity to furnish satisfactory concentration tests are excluded, 164 remain on which all four tests were performed. Of these, 134 were negative by all methods, 14 positive by all methods, except Ziehl-Neelsen direct smear, 7 were positive by both fluorescence direct smear and concentrate and negative by both Ziehl-Neelsen examinations, 1 was positive by both concentration tests and negative on both direct smears and 8 were positive by fluorescence concentration only. If all specimens positive by any method are considered to yield the total number of positives, fluorescence examinations of concentrates give 100 per cent positives, fluorescence examinations of direct smear 92.3 per cent, Ziehl-Neelsen examination of concentrates 87 per cent and Ziehl-Neelsen examination of direct smears 74.3 per cent. Of the specimens negative by Ziehl-Neelsen stains and positive by fluorescence methods, 10 were obtained from patients on whom a diagnosis of pulmonary tuberculosis had previously been made; 4 of the patients furnished sputums that were posi-

tive by both fluorescence direct smear and concentrate methods and 6 positive by fluorescence concentration only. All except 2 patients were classified as being in the active stage of the disease, and 1 of these would have been transferred from "apparently arrested" to "arrested" without fluorescence examinations. The other, although classified as arrested, apparently had an unstable lesion and this examination indicated activity earlier than it was apparent by Ziehl-Neelsen stains or clinical observation. Six weeks after this positive fluorescence examination there was a Gaffky I finding on direct smear by Ziehl-Neelsen staining, and subsequently five positive Gaffky I and Gaffky II smears were obtained. The requirement that sputum shall be concentrated and examined by the Ziehl-Neelsen method before being called negative is met and even surpassed by direct fluorescence examinations. Concentration and examination by fluorescence offers a more delicate test than has heretofore been available and, at least for the present, it should be reserved for investigational work. It should not be substituted for the present accepted and less sensitive methods in the clinical evaluation and classification of patients until further information is obtained as to the clinical significance of its results. Fluorescence microscopy has the following advantages over older methods for examining sputum smears and other material for the presence of tubercle bacilli: 1. The method stains more acid-fast bacteria than are stained by the Ziehl-Neelsen technic. 2. Examinations can be made with high dry objectives covering fields which are larger than oil immersion fields. 3. A greater contrast obtains between the stained organism and other material present on the slide.

Detection of Tubercle Bacilli by Fluorescence Microscopy.

—Bogen states that the comparison at the Olive View Sanatorium of 1,000 duplicate smears of routine sputum specimens stained by the fluorescence microscopy and the carbolfuchsin method generally confirms the published reports that the fluorescence method gives more than 20 per cent more positive results than the standard technic. Some slides which showed a few organisms by the latter procedure failed to reveal them by the newer method. These discrepancies were probably due to technical error or chance distribution of a few organisms and insufficient examination rather than to the existence of organisms stained by only one method. With low magnification it is theoretically possible to examine every part of the smear with the fluorescence microscope in less than twenty minutes in comparison to the eight or more hours required with the usual oil immersion magnification. Of 250 specimens negative to Ziehl-Neelsen, 60 were positive when inoculated on Jensen's and Petragnani's culture mediums and 29 were positive on fluorescence microscopy. The majority of the fluorescent negative specimens positive on culture gave only a sparse growth on one out of several tubes planted. Fluorescence microscopy may not yet supplant standard procedures for the detection of tubercle bacilli, but it constitutes a useful supplement for diagnostic and public health practice.

Pneumoperitoneum and Phrenic Paralysis.—Rilance and Warring point out that their experience with pneumoperitoneum has been confined to its use as a supplement to phrenic paralysis in an attempt to elevate the paralyzed hemidiaphragm. Indications were those usually accepted for phrenicectomy. Frequently the combined procedure closed the cavity and reversed the sputum while phrenicectomy alone had failed. Supplementary pneumoperitoneum was carried out on 55 consecutive patients with pulmonary tuberculosis treated by phrenicectomy. The patients were observed for from twelve to thirty-five months. In 18, or 33 per cent, an insufficient rise (2 cm. or less) was obtained and pneumoperitoneum was discontinued. Of the remaining 37 patients, 1 had minimal, 9 had moderately advanced and 27 had far advanced pulmonary tuberculosis. Only 1 patient had a negative sputum before treatment; 15 of the 36 with positive sputums later had consistently negative sputums, 3 have continued to show an intermittently positive sputum (2 of these show definite evidence of tracheobronchial tuberculosis) and the sputums of 18 have remained consistently positive during and after treatment. Definite cavities were depicted in the stereoroentgenograms of 34 patients, all with positive sputums, prior to treatment. The rise of the hemidiaphragm after phrenicectomy averaged 2.8 cm. in the 37 mechanically

successful instances. The average additional elevation from pneumoperitoneum was 4.1 cm.; the average total rise was 6.9 cm. The cavities of 19 of the 34 patients with opened cavities closed following treatment, in 2 they were questionably closed and in 10 they became smaller. Cavities of various sizes seemed to respond almost equally well. A higher incidence of cavity closure was found to occur when the cavity was located in the lower third of the lung field, the next best incidence was among apical cavities and then with those located in the middle third of the pulmonary field.

Annals of Surgery, Philadelphia

114:321-480 (Sept.) 1941

- Experimental Cerebral Trauma: III. Effects of Acute Uremia, Venous Obstruction, Hyperthermia and Intensive Irradiation on Water Content of Dog's Brain. T. E. Wyatt and C. Pileher, Nashville, Tenn.—p. 321.
- Cerebellar Abscesses of Otic Origin in Nine Children: Eight Recoveries After Cannulation. F. Schreiber, Detroit.—p. 330.
- Surgical Treatment of Intracranial Aneurysms of Internal Carotid Artery. W. E. Dandy, Baltimore.—p. 336.
- *Cancer of Lip. H. Martin, W. S. MacComb, New York, and J. V. Blady, Philadelphia.—p. 341.
- Perforation of Cervical Esophagus with Flexible Gastroscope: Case Report—Diagnosis—Treatment. A. S. W. Touroff, New York.—p. 369.
- Actual Holding Power of Various Screws in Bone. W. F. Lyon, J. R. Cochran and L. Smith, Chicago.—p. 376.
- Morbid Influences in Intestinal Obstruction and Strangulation. I. Aird, Edinburgh, Scotland.—p. 385.
- Muscular Activity of Small Intestine, in Dog, During Acute Obstruction. R. F. Antonic and H. Lawson, Louisville, Ky.—p. 415.
- Significance of Neuromatous Lesions in Obliterated Appendixes: Clinicopathologic Study. M. L. Parker and M. Corrigan, Chicago.—p. 424.
- Influence of External Secretion of Pancreas on Lipid Metabolism. M. L. Montgomery, San Francisco.—p. 441.
- Role of Second Thoracic Spinal Segment in Preganglionic Sympathetic Innervation of Human Hand—Surgical Implications. L. N. Atlas, Cleveland.—p. 456.
- Jejunostomy for Postoperative Feeding. H. M. Clute, Boston, and L. M. Bell, Winchester, Va.—p. 462.
- Studies on Use of Metals in Surgery. E. Campbell, A. Meirowsky and Gertrude Hyde, Albany, N. Y.—p. 472.

Cancer of Lip.—According to Martin and his co-workers, a five year cure rate of 70 per cent was obtained in their consecutive series of 375 microscopically proved primary and recurrent cancers of the lip. Thirty-nine of the patients died of other causes without recurrence and 23 when lost track of had no recurrence. Of the remaining 313 patients 87 died as a result of their cancer, 4 were lost track of with the disease, 3 are living with the disease and 219 are living and free from the disease five or more years after roentgen, radium or surgical treatment. Cancer of the lower lip is the least malignant form of all intraoral cancers. Practically all early lesions up to 1.5 cm. in diameter should be cured by proper initial treatment and regular examination for recurrence. The following factors influence the cure rate: 1. The prognosis appears best below the age of 40 and over 60. 2. The capacity of a lesion to metastasize is prognostic. In the present series the cure rate was 95 per cent for those patients who never had any metastases. 3. The prognosis is best in low grade squamous carcinoma and poorest in grades 2 and 3. 4. When the diameter of the primary lesion is less than 1 cm., almost a 100 per cent cure may be assured. As the size of the primary lesion increases, cure diminishes. However, if the patient survives long enough for the primary lesion to involve the whole lip, the tumor is almost always of a low grade and apparently incapable of metastasizing and cure depends on the control of the primary lesion. 5. Growths of the upper lip are spontaneous cancers and are highly malignant as compared to irritation cancers of the lower lip. This is supported by the fact that of the authors' 17 patients with primary lesions on the upper lip only 7 (41 per cent) survived five years. 6. The cure rate in lip cancer associated with syphilis is 52 per cent. This finding may be purely coincidental, since the number of patients with syphilis (25) was small. 7. Previous unsuccessful attempts at treatment reduced the possibility of cure. The cure rate was only 52 per cent among patients referred to the authors with residual and recurrent disease after unsuccessful treatment elsewhere. The surgeon who undertakes the treatment of cancer places himself under a moral responsibility to keep the patient under observation for at least five years, during which time recurrence is most likely to take place, and treated while the disease is still in a curable stage.

Archives of Ophthalmology, Chicago

26:341-542 (Sept.) 1941

- Chagas' Disease: Ocular Conjunctiva as Most Frequent Route of Infection. C. de Andrade, Bahia, Brazil, South America.—p. 341.
- Detachment of Pars Ciliaris Retinae: Contribution to Diagnosis of Malignant Intraocular Tumors. Bertha A. Klien, Chicago.—p. 347.
- Boeck's Sarcoid with Ocular Localization: Survey of Literature and Report of Case. J. M. Levitt, Brooklyn.—p. 358.
- Stereoscope as Orthoptic Instrument. A. Linksz, Hanover, N. H.—p. 389.
- *Interstitial Keratitis: Analysis of 532 Cases with Particular Reference to Standardization of Treatment. J. V. Klauder, Philadelphia, and Eleanor Vandoren, Washington, D. C.—p. 408.
- *Treatment of Staphylococic Blepharoconjunctivitis with Staphylococcus Toxoid. P. Thygeson, New York.—p. 430.
- Ophthalmoscopically Visible Retinal Lesions in Chronic Glomerulonephritis: Occurrence and Characteristics. R. W. Graham, Rochester, Minn.—p. 435.
- Light Threshold: Its Clinical Evaluation. J. B. Feldman, Philadelphia.—p. 466.
- Distribution of Sulfanilamide and Its Derivatives Between Blood and Aqueous. S. D. Liebman and E. H. Newman, Boston.—p. 472.
- Specific Nerve Sheath Tumor of Orbit (Neurilemmoma, Neurinoma): Report of Case with Review of Literature. A. Rottino and A. S. Kelly, New York.—p. 478.
- Retinal Hemorrhage Following Transfusion. G. L. Walker, Roanoke, Va., and P. J. Leinfelder, Iowa City.—p. 489.
- Applied Anatomy of Eye: Its Relation to Ophthalmic Surgery. R. E. Meek, New York.—p. 494.
- Intracranial Blood Flow in Insulin Coma. E. B. Ferris Jr., M. Rosenbaum, C. D. Aring, H. W. Ryder, E. Roseman and J. R. Hawkins, Cincinnati.—p. 509.

Interstitial Keratitis.—Klauder and Vandoren studied the records of 532 congenitally syphilitic patients with interstitial keratitis who were treated or observed for at least one year. The value of the various methods antisyphilitic treatment on the final visual acuity of the patient were particularly analyzed. Of the patients 73 per cent were white, 60 per cent were female and the median age at onset was 12 years for the female and 13 years for the male patients. Thirty per cent of patients with inactive interstitial keratitis previously treated had negative serologic reactions as opposed to 2.5 per cent of those with active interstitial keratitis who were untreated. Other syphilitic manifestations were Hutchinson teeth in 40, involvement of bones and joints in 35, labyrinthine disease in 10, chorioretinitis in 8, symptomatic and asymptomatic neurosyphilis in 8 and dementia paralytica (including the tabetic form) in 0.4 per cent. In 42 per cent the eyes were involved either simultaneously or within one month of each other. The second eye of 79 per cent was involved by the tenth year. Treatment administered in the inactive stage was of limited value in improving visual acuity. There was little difference in the visual acuity of the better eyes of patients treated continuously, intermittently or irregularly. However, for the poorer eye continuous treatment was slightly superior. The final visual acuity of both eyes of 64 per cent of the patients treated continuously was good or excellent, as compared to 47 and 48 per cent of patients treated intermittently or irregularly. Less poor visual acuity or blindness was observed in patients treated continuously or intermittently than in those treated irregularly. The comparative effectiveness of any one arsenical was not possible to ascertain, as most patients were not treated exclusively with one arsenical. Arsphenamine and neoarsphenamine produced approximately the same percentage of excellent visual acuity. A comparison of the various agents producing fever therapy, in conjunction with routine treatment consisting of arsenicals and a heavy metal, shows that the best results were obtained with malaria and hyperthermy. These two hyperpyrexia agents produced the highest temperature. Routine treatment supplemented with fever therapy was superior to other forms of treatment in preventing relapse; only 1 of 55 patients so treated had a relapse. Relapses after other types of treatment ranged from 13 to 18 per cent. Relapse was more frequent in patients treated with less than twenty injections of an arsenical than among those treated with more than twenty injections.

Staphylococic Blepharoconjunctivitis.—Thygeson immunized 83 patients with staphylococic blepharoconjunctivitis resistant to local antiseptic therapy with staphylococcus toxoid. Local treatment was continued. Healing occurred in 22, moderate or considerable improvement in 53 and little or no improvement in 8. The conjunctivitis in the patients who became free from pathogenic staphylococci showed no tendency

to recur, but in those who experienced symptomatic but not bacteriologic cure it generally recurred in from three to six months. Treatment consisted of from twelve to fourteen weekly or biweekly injections of toxoid. The initial dose of 0.02 cc. was increased to 1 cc. Doses up to 0.3 cc. were given intracutaneously and the remainder subcutaneously. If there was no improvement or if cultures continued to show toxigenic staphylococci after this course of treatment, 0.5 cc. of toxoid was given once a week for at least one month.

Archives of Otolaryngology, Chicago

34:429-686 (Sept.) 1941

- Acoustic Trauma in Man: Clinical and Experimental Studies. H. B. Perlman, Chicago.—p. 429.
Multiple Myeloma with Laryngeal Metastasis. G. B. Gilmore, New York.—p. 453.
Lempert Endaural, Antauricular Surgical Approach to Temporal Bone. K. Kettle, Hillerød, Denmark.—p. 461.
Pneumococcus Type III in Otitic Infections. A. H. Persky, Philadelphia.—p. 473.
Abscess of Mandibular Fossa Secondary to Otitis Media. H. I. Lillie and K. M. Simonton, Rochester, Minn.—p. 485.
Leiomyosarcoma of Larynx: Report of Case. D. I. Frank, New York.—p. 493.
Reversal of Halistheresis in Mammalian Ear. L. K. Guggenheim, L. Gunther, V. Goodhill and Mary Irvine, Los Angeles.—p. 501.
Quantitative Effects of Physical and Chemical Agents on Erectile Tissue Response in Nose. H. J. Sternstein, Boston.—p. 523.
Incidence of Atrophy of Olfactory Nerves in Man. C. G. Smith, Toronto, Canada.—p. 533.
*Use of Prostigmine for Impaired Hearing. M. Rosenthal, New York.—p. 540.
Cicatrical Atresia of Esophagus. H. J. Hara and L. K. Rosenvold, Los Angeles.—p. 574.
Paranasal Sinuses. S. Salinger, Chicago.—p. 603.

Prostigmine Methylsulfate for Impaired Hearing.—Rosenthal determined what improvement, if any, was experienced by 30 patients with impaired hearing from prostigmine methylsulfate therapy. Twenty-four of the patients had had loss of hearing for many years. The loss was acute in 1 and in 5 not longer than six months; 23 had associated tinnitus. Treatment was begun with the application of a large nasal tampon saturated with a 10 per cent solution of mild protein silver. This was left in place for thirty minutes, followed by irrigation and suction, and then an intramuscular injection of 1 cc. of a 1:2,000 solution of prostigmine methylsulfate was given. The treatments were given three times a week. Nineteen patients, 6 with acute and 13 with chronic impairment, showed objective improvement (more than 5 decibels, 5 or less decibels was accepted as a margin for error), 16 claimed subjective improvement, 9 no improvement and 2 reported that the condition had become worse. Sixteen said that the tinnitus had disappeared or diminished. When a high decibel loss exists at the initial reading an improvement up to 10 decibels may not evoke any subjective reaction, while if the initial loss is in the medium range an improvement of even 5 decibels elicits a subjective response. The subjective response shows greater improvement in some frequencies; the frequency of greatest value in this respect is 2,048. Thirteen of the 24 patients with chronic impairment reported subjective improvement and 19 showed some objective improvement. The 5 patients with recent impairment, with initial losses not greater than 35 decibels, claimed definite improvement, even though in 1 the greatest change was only 5 decibels in one ear. The high degree of improvement reported by Davis and Rommel was not experienced by the author's 30 patients.

California and Western Medicine, San Francisco

55:113-166 (Sept.) 1941

- Leukemia: Evaluation of Therapy. S. P. Lucia, San Francisco.—p. 119.
Sulfonamide Group of Drugs: General Properties, Use and Dosage. A. Haim, San Francisco.—p. 123.
Sulfanilamide Group of Drugs: Use in Diseases of Ear, Nose and Throat. L. F. Morrison, San Francisco.—p. 126.
Extrahepatic Duct Stones: Indications and Problems Relative to Their Surgical Care. E. E. Larson, Los Angeles.—p. 129.
Priapism from Hypernephroma Metastases in Cavernous Bodies. L. G. Craig, Pasadena.—p. 135.
Sickness Insurance and Health Service: A Difference, with Special Reference to California Physicians' Service. A. E. Larsen, San Francisco.—p. 139.

Florida Medical Association Journal, Jacksonville

28:1-52 (July) 1941

- Banting: Benefactor of Mankind. S. Harris, Birmingham, Ala.—p. 15.
Fallacious Views Concerning Rhinologic Surgery and Factors Influencing More Successful Results. A. R. Hollender, Miami Beach.—p. 27.
Occlusive Lesions of Peripheral Blood Vessels. R. B. Harkness, Lake City.—p. 29.
Use of Solution of Posterior Pituitary in Normal Labor. C. B. Wright, St. Petersburg.—p. 33.

28:53-100 (Aug.) 1941

- Sporotrichosis: Report of Case. E. D. French, Miami.—p. 61.
Treatment of Injuries of Hand. M. P. Travers, Miami Beach.—p. 66.
Cardiac Arrhythmias. J. W. Annis, Lakeland.—p. 71.
Review of Some Drugs Commonly Used in Urology. A. L. Mills, St. Petersburg.—p. 78.
Treatment of Gonorrhea with Sulfanilamide. H. J. Ireland, New York, and C. Lippow, Miami Beach.—p. 82.
Value of Intrapleural Pneumolysis in Artificial Pneumothorax Therapy in Pulmonary Tuberculosis. T. C. Black, Orlando.—p. 84.

Journal of Nat. Cancer Inst., Washington, D. C.

1:727-864 (June) 1941

- Review of Progress in Study of Genetics of Spontaneous Tumor Incidence. C. C. Little, Bar Harbor, Maine.—p. 727.
Spontaneous Tumors in Subline of Strain C3H Mice. H. B. Andervont, with technical assistance of W. J. McEleney, Washington, D. C.—p. 737.
Changes in Cellular, Nuclear and Nucleolar Sizes During Methylcholanthrene Epidermal Carcinogenesis. E. V. Cowdry and F. X. Paletta, St. Louis.—p. 745.
Length of Survival of Mice with Induced Subcutaneous Sarcomas. M. B. Shimkin, Bethesda, Md.—p. 761.
Survey of Radiation Protection in Hospitals. D. B. Cowie and L. A. Scheele, Washington, D. C.—p. 767.
Biologic Significance of Tolerance Dose in X-Ray and Radium Protection. P. S. Henshaw, Washington, D. C.—p. 789.
Quantitative Analysis of Dose-Response Data Obtained with Carcinogenic Hydrocarbons. W. R. Bryan and M. B. Shimkin, Bethesda, Md.—p. 807.
The *d*-Peptidase Activity of Serum as Alleged Diagnostic Test for Cancer. Mary E. Maver, J. M. Johnson and J. W. Thompson, Washington, D. C.—p. 835.
Depolymerization of Thymonucleic Acid by an Enzyme System in Normal and Cancerous Hepatic and Mammary Tissues and in Milk and Serums of Several Species. J. P. Greenstein and W. V. Jenrette, Washington, D. C.—p. 845.

New England Journal of Medicine, Boston

225:317-350 (Aug. 28) 1941

- *Pericardiostomy for Suppurative Pericarditis: Report Concerning Ten New Cases and Twenty-Eight Cases from Literature. J. W. Strieder and W. R. Sandusky, Boston.—p. 317.
Dysphagia and Nutritional Deficiency. D. Merrill and R. Richards, Wrentham, Mass.—p. 326.
Left Sided Pain in Biliary Tract Disease. J. Fine and A. Starr, Boston.—p. 330.
Anthrax: Report of Case Treated with Antiserum and Sulfathiazole. R. W. Provenzano, G. E. Carriel and Arlene Bloomer, Lowell, Mass.—p. 332.
Thoracic Surgery. E. D. Churchill, Boston.—p. 335.

Pericardiostomy for Suppurative Pericarditis.—Strieder and Sandusky report 5 cases of acute suppurative pericarditis in which Strieder performed a pericardiostomy, 5 cases from the Boston City Hospital and review the 28 cases reported in the literature from January 1934 to January 1940. This brings the total of recorded cases to 265. The disease is never primary (unless direct trauma is considered primary). Pericarditis may be obscured by the original infection, particularly infection within the thorax. Seven of the authors' cases were secondary to pneumonia and/or empyema, 2 were secondary to septicemia and 1 followed a stab wound. Of the 38 cases reported since 1934, 27 followed thoracic infections. An improvement in diagnosis will be obtained only if in the absence of localizing symptoms careful repeated examinations are made of the cardiac region. However, if a friction rub is not heard and there is no increase in intrapericardial fluid the diagnosis cannot be made. No rub was heard in 5 of the 10 cases under discussion. Roentgen examination should be carried out in the upright and prone positions so that the resultant pericardial shadows may be observed. In questionable cases pericardicentesis or exploratory operation is indicated. The former should be carried out before exploration is undertaken. Pericardicentesis was performed without incident in 9 of the authors' 10 cases; in the tenth the diagnosis was established by pus draining from the stab wound. Although pericardiostomy itself is attended with little or no risk, the authors qualify this by stating that if fluid

is not obtained by pericardicentesis after one or two attempts further efforts should be abandoned in favor of exploration, particularly if the patient is suffering from the effects of cardiac tamponade. If organisms cannot be demonstrated in the fluid obtained by pericardicentesis, an empyema exists or the patient has had pneumonia and is suffering from pericarditis, pericardiostomy should be performed in the face of this negative evidence, as considerable advantage can be derived from drainage before the pus becomes thick and fibrinous. One cannot know whether the fluid will remain sterile or become purulent, but, if the patient is relieved by pericardicentesis and the fluid remains clear, perhaps repeating the aspiration and observing the character of the fluid for a day or two is justified. Without treatment the mortality approaches 100 per cent; with pericardiostomy the mortality is 50 per cent. Chemotherapy as a supplement to pericardiostomy should further reduce the mortality.

New Orleans Medical and Surgical Journal

94:105-154 (Sept.) 1941

- Treatment of Chronic Suppurative Otitis Media with Use of Endaural Approach for Radical Mastoidectomy. G. E. Shambaugh Jr., Chicago.—p. 105.
- Interrelationship of Gastrointestinal and Cardiac Disease. M. D. Hargrove, Shreveport, La.—p. 111.
- Treatment of Inflammatory Conditions by X-Ray. L. J. Williams, Baton Rouge, La.—p. 117.
- Conservative and Operative Treatment of Fractures of Neck of Femur. H. T. Simon, New Orleans.—p. 119.
- Fractures in Children. S. M. Copland and M. Finn, New Orleans.—p. 123.
- Surgical Management of Goiter. H. Mahorner, New Orleans.—p. 129.
- Public Health and the General Practitioner. J. H. Musser, New Orleans.—p. 137.
- Delayed Birth Registration in Louisiana. E. F. Ricketts and L. A. Wilson, New Orleans.—p. 141.

New York State Journal of Medicine, New York

41:1603-1698 (Aug. 15) 1941

- Undulant Fever with Visual Disturbances. L. W. Jones and J. L. Norris, Rochester.—p. 1625.
- Blood Pressure Studies in the Aged. I. Miller, New York.—p. 1631.
- Tetanus—Its Prevention and Treatment. J. K. Calvin, Chicago.—p. 1636.
- Allergic Reactions in the Abdomen. T. W. Clarke, Utica.—p. 1642.
- Responsibility of the General Practitioner in Chronic Glaucoma. B. Esterman, New York.—p. 1646.
- Occupational Asthma and Vasomotor Rhinitis: Outline of Some Common Industries Where These Symptoms Are Initiated. L. Sternberg and A. H. Sorrell, New York.—p. 1649.
- Use of Vitamin K in Obstructive Jaundice. G. S. Reed, Syracuse.—p. 1653.
- Treatment of Uveitis. J. F. Gipner, Rochester.—p. 1656.

41:1699-1794 (Sept. 1) 1941

- Importance of Investigation of Personality Factors in Psychosomatic Problems in Medicine. E. J. Doty, New York.—p. 1723.
- Practical Aspects of Psychiatric Management in Psychosomatic Problems. G. E. Daniels, New York.—p. 1727.
- Treatment of Favus of Scalp. G. M. MacKee, G. M. Lewis and Mary E. Hopper, New York.—p. 1733.
- Practical Operation of Preserved Blood and Pooled Plasma Program in Suburban Hospital. J. W. Ehrlich, White Plains.—p. 1737.
- Physical Defects in Genesis of Juvenile Delinquency. F. Blumenthal, Warwick.—p. 1749.
- Treatment of Regional Ileitis. H. Sneiderman, Binghamton.—p. 1755.
- Stevens-Johnson Disease with Complete Visual Recovery. I. Givner and H. Ageloff, New York.—p. 1762.

Northwest Medicine, Seattle

40:309-350 (Sept.) 1941

- Clinical Use of Sulfonamide Compounds in Prophylaxis and Treatment of Infections. P. H. Long, Baltimore.—p. 311.
- Experience with New Sulfonamide in Urologic Practice. W. L. Ross Jr., Yakima, Wash.—p. 321.
- False Positive Serologic Tests for Syphilis in Children. M. L. Bridgeman and L. D. Jacobson, Portland, Ore.—p. 325.
- Infectious Relapse in Syphilis. J. C. Kern, Lewiston, Idaho.—p. 328.
- Treatment of Chronic Ulcerative Colitis Based on Thirty Cases. A. C. Reed and F. Rochex, San Francisco.—p. 332.
- Care of Paralyzed Bladder Secondary to Spinal Fractures. R. T. Scott, Lewiston, Idaho.—p. 336.
- Stillbirth in Mental Manifestations of Menopause. N. K. Rickles, Seattle.—p. 339.

Ohio State Medical Journal, Columbus

37:821-924 (Sept.) 1941

- Leptospirosis Icterohemorrhagica (Weil's Disease): Report of Three Cases. H. F. Deubel, Hamilton.—p. 837.
- Intussusception Due to Meckel's Diverticulum: Report of Four Cases. J. R. Sprague, Athens, and R. S. Srigley, Columbus.—p. 843.
- Technic for Studying Experimentally Induced Convulsive Seizures. O. P. Kimball, Cleveland.—p. 846.
- Use of Beta Erythroidine Hydrochloride in Metrazol Therapy: Preliminary Report. J. M. Williams, Washington, D. C.—p. 849.
- Nature and Modern Treatment of Depressions. J. L. Fetterman, Cleveland.—p. 855.
- *Public Health Aspects of Trichinosis Control. E. R. Shaffer, Akron.—p. 862.
- Acute Bacterial Endocarditis and Septicemia During Puerperium: Case. S. Koletsky, Cleveland.—p. 866.
- Some Early Recollections. C. Ginn, Dayton.—p. 868.

Control of Trichinosis.—Shaffer points out that in the last ninety-four years the mortality rate for trichinosis cases has decreased from 15.4 per cent during 1842-1914 to 4.4 per cent during 1926-1936. This indicates that more mild cases are being diagnosed and reported now than formerly. Either these cases were formerly overlooked or else they occur more frequently. Assuming the latter, it may be due to the fact that now pork products are usually made up from several hogs by modern processing and thus the products from the infected hog are more widely dispersed and the chance of infecting more people is greater than formerly, while at the same time the infection is less severe. On the basis of the 10,424 diaphragm examinations that have been made, 960,000 persons in Ohio are infected with *Trichina spiralis*. This average percentage applied to living populations would mean that 17,000,000 people in this country are so infected. The author believes that many cases of so-called intestinal "flu" may be abortive cases of trichinosis; the symptoms are quite similar. There is a definite seasonal fluctuation, with the peak in the winter months, primarily following the winter holidays, owing to the fact that large populations of foreign descent continue to crave meat preparations containing at least some pork. These cold raw or partially cooked meat products are most frequently responsible for trichinosis infection. States having the highest morbidity rate are those of the extreme eastern and western sections. Trichinosis is probably a greater problem in the United States than in any other country. Evidence to this effect was available fifty years ago but was overlooked, disregarded or misinterpreted. Many public health officials believe that trichinosis is one of the most important public health problems today. The public should be warned to cook not only pork but all meats thoroughly. If municipalities continue to countenance the garbage feeding industry, legislation should be instigated requiring cooking of all garbage before it is fed to swine or other stock. Since the annual pig crop is consumed annually, any improvement in feeding and marketing put into effect one year should have its results in control the succeeding year.

Oklahoma State Medical Assn. Jour., Oklahoma City

34:373-418 (Sept.) 1941

- Discussion of Certain Physiologic Problems in Treatment of Peptic Ulcer. W. P. Fite, Muskogee.—p. 373.
- Etiology and Management of Contraction Ring Dystocia. J. R. Reinberger, Memphis, Tenn.—p. 375.
- Fevers of Obscure Origin in Early Life. W. M. Taylor, Oklahoma City.—p. 379.
- Some Everyday Problems in Pediatric Practice. C. W. Arrendell, Ponca City.—p. 380.
- Management of Congenital Absence of Vagina. L. Sadler, Oklahoma City.—p. 382.
- Heparin: Its Practical Use in Thrombosis and Embolism. P. M. Schreck, Tulsa.—p. 386.

Quarterly J. of Studies on Alcohol, New Haven, Conn.

2:1-240 (June) 1941. Partial Index

- Alcohol and Epilepsy. W. G. Lennox, Boston.—p. 1.
- Alcoholism at Boston City Hospital. M. Moore and M. Geneva Gray, Boston.—p. 18.
- "Adaptation" of Central Nervous System to Varying Concentrations of Alcohol in Blood. J. A. Mirsky, P. Piker, M. Rosenbaum and H. Lederer, Cincinnati.—p. 35.
- Vitamin Deficiencies and Liver Cirrhosis in Alcoholism: Parts IV, V and VI. N. Jolliffe, H. Wortis and M. H. Stein, New York.—p. 73.
- Alcohol Addiction and Its Treatment. K. M. Bowman, New York, and E. M. Jellinek, New Haven, Conn.—p. 98.

Southern Medical Journal, Birmingham, Ala.**34:789-898 (Aug.) 1941. Partial Index**

- Management of Old Contractures of Upper Extremity Resulting from Third Degree Burns. R. Jones Jr., Durham, N. C.—p. 789.
- Cancer of Rectum, Sigmoid and Anus: Review of Forty Cases Seen During Year 1939. H. T. Hayes and H. B. Burr, Houston, Texas.—p. 806.
- Practical Consideration of Cancer of Sigmoid and Rectum. A. S. Graham, Richmond, Va.—p. 812.
- Protracted Roentgen Therapy of Malignancies, Particularly of Head and Face. D. A. Rhinehart and B. A. Rhinehart, Little Rock, Ark.—p. 820.
- Vesical Dysfunction from Lesions of Cauda Equina: Physiology of Micturition. L. G. Lewis, Baltimore.—p. 823.
- Stokes-Adams Syndrome: Report of Two Cases Treated with Metrazol. M. J. Myres, Daytona Beach, Fla.—p. 833.
- Engineering in Malaria Control. C. C. Kiker, Wilson Dam, Ala.—p. 839.
- Experimental Wells: Their Use in Study of Water Table in Relation to Malaria Control Drainage Program. D. B. Lee, Jacksonville, Fla.—p. 840.
- Early Treatment of Squint. O. Wilkinson, Washington, D. C.—p. 844.
- Résumé of Conservative Sinus Management. J. H. Moore, Huntington, W. Va.—p. 848.
- Atopic Factor in Urticaria. B. Swinny, San Antonio, Texas.—p. 855.
- Indications for Sulfonamide Derivatives in Treatment of Asthma. C. K. Weil and H. J. Climo, Montgomery, Ala.—p. 858.
- Eczema in Infancy and Childhood. Katherine Bain, St. Louis.—p. 863.
- Observations on Atopic Dermatitis. L. M. Smith and R. P. Hughes, El Paso, Texas.—p. 870.
- Ureteral Stricture: Its Frequency and Diagnosis. G. L. Hunner, Baltimore.—p. 885.

Surgery, St. Louis**10:369-534 (Sept.) 1941**

- Bacteriology of Peptic Ulcers and Gastric Malignancies: Possible Bearing on Complications Following Gastric Surgery. G. P. Seley and R. Colp, New York.—p. 369.
- Leiomyoma Malignum of Stomach. F. Christopher, E. L. Benjamin and L. W. Sauer, Evanston, Ill.—p. 381.
- Effect of Colloidal Aluminum Hydroxide on Certain Aspects of Blood Coagulation. M. T. Fliegelman, Lillian M. Panzer and J. E. Rhoads, Philadelphia.—p. 387.
- *Peritoneoscopy: Analysis of 150 Cases. C. B. Olim, Memphis, Tenn.—p. 391.
- Self-Introduced Foreign Body Perforating Large Bowel: Operation with Recovery. P. Thorek, Chicago.—p. 405.
- Excision and/or Proximal Ligation of Extraosseous Thrombophlebitis in Treatment of Acute Hematogenous Osteomyelitis with Positive Blood Culture. A. O. Wilensky, New York.—p. 409.
- Mesodermal Mixed Tumors of Corpus Uteri: Report of Case with Review of Literature. R. J. Lebowich and H. E. Ehrlich, Gloversville, N. Y.—p. 411.
- Nontraumatic Intracerebral Hemorrhage with Clot Formation: Report of Six Operative Cases. R. M. Klemme, St. Louis.—p. 434.
- *Diagnosis and Treatment of Subdural Hematomas. H. C. Voris, Chicago.—p. 447.
- Reconstructive Otoplasty. P. W. Greeley, Chicago.—p. 457.
- Chronic Undermining Burrowing Ulcer: Report of Case Treated by Local Applications of Sulfanilamide. E. L. Besser and J. W. Dulin, Iowa City.—p. 462.
- Abscess of Lung: Bronchopulmonary Segment, Basis for Clinical Localization. A. Glass, New York.—p. 465.
- Simultaneous Bilateral Spontaneous Pneumothorax: Discussion of Its Mechanism and Report of Case. C. Waltman and J. E. Leach, New York.—p. 476.

Peritoneoscopy.—Olim carried out peritoneoscopy in 150 cases. A follow-up of the 150 patients reveals that the diagnoses of 44 have been proved at necropsy, operation or biopsy. The clinical diagnosis was correct in 24 of these 44 patients and the peritoneoscopic diagnosis in 40. These figures compare closely with those compiled by Ruddock. The peritoneoscopic accuracy should remain consistently high if the cases to be examined are properly selected. Only those organs which either lie superficially in the peritoneal cavity or may be brought into location by postural changes or manipulation are amenable to visualization. The most satisfactory peritoneoscopy results are obtained in hepatic cirrhosis, hepatic malignant growths, tuberculous peritonitis, peritoneal malignant changes, ectopic pregnancy, intraperitoneal hemorrhage, pathologic changes within the pelvis and in determining the operability of gastric cancer. Three accidents occurred among the 150 patients, only 1 of whom died. Many of the patients examined were bad risks subjected to peritoneoscopy with the hope that laparotomy could be avoided. Compared with laparotomy, peritoneoscopy is a minor procedure followed by little discomfort. It is economically important since the patient is hospitalized for only one day. Peritoneoscopy will not supplant laparotomy but it will often show operation to be unnecessary and vice versa. The four peritoneoscopic errors were (1) the diagnosis of ovarian cyst proved at operation to be a tubo-

ovarian abscess, (2) failure to recognize an acute yellow atrophy of the liver in a boy, (3) peritoneoscopic diagnosis of abdominal Hodgkin's disease proved at necropsy to be a metastatic carcinoma and (4) the inability to determine the nature of a deeply situated abdominal mass which operation revealed to be a carcinoma of the mesentery.

Subdural Hematomas.—Voris discusses a series of 35 consecutive subdural hematomas in which operation was performed with a mortality of 43 per cent. The mortality was 24 per cent (9 patients) for those patients operated on more than three days after injury. Clots were removed from 34, and in 1 the clot was not found on the side indicated by the neurologic signs and the other side was not explored. Necropsy was performed by the coroner's physician on 5 of the patients operated on within three days; cerebral contusion or laceration was present in all. One of these was a patient with bilateral subdural clots who had two explorations a week apart and died from meningitis after the second exploration. Necropsy was performed on 5 of the 6 patients who died and had been operated on more than three days after injury. In 1 of these an unrecognized clot on the side opposite to that explored was present. The other 4 had pulmonary pathologic changes of bronchopneumonia or pulmonary abscess thought to be the cause of death. The mortality was very high (9 of 10 patients) in the acute or early subdural hematoma; that is, in unencapsulated clots operated on within three days of injury. These clots are often associated with cerebral injury. The mortality is also high in old people. Chronic or late subdural hematomas in the young or the middle aged without associated systemic disease have a good prognosis if operated on before increased intracranial pressure has rendered the patient moribund. Exploration should always be bilateral, especially if no clot is found on the first side explored. Two deaths in the present series ensued because this was not done. If the brain does not expand to fill the space previously occupied by the evacuated clot, measures such as filling the subdural space with distilled water to induce expansion must be instituted.

Western J. Surg., Obst. & Gynecology, Portland, Ore.**49:467-526 (Sept.) 1941**

- *Clinical Experiences with Diethylstilbestrol. W. M. Wilson, Portland, Ore.—p. 467.
- Clinical Effects of Stilbestrol: "Adaptation" Phenomenon. B. Vidgoff, Portland, Ore.—p. 476.
- Clinical Report on Stilbestrol. J. C. Brougher, Vancouver, Wash.—p. 478.
- *Appendicitis: Study of Diagnostic Error Showing Hazards of Deferred Operation. H. M. Nichols, Portland, Ore.—p. 480.
- Severe Hypoglycemia Due to Islet Adenoma of Pancreas with Surgical Cure. W. L. Winters, P. Gottardo and R. W. McNealy, Chicago.—p. 488.
- *Graves' Disease with Dissociation of Thyrotoxicosis and Ophthalmopathy. S. Hertz, J. H. Means and R. H. Williams, Boston.—p. 493.
- Liver Damage in Thyroid Disease. V. E. Chesky, C. R. Schmidt and W. R. Walsh, Halstead, Kan.—p. 499.
- Prevalence of Mild Hypothyroidism with Normal Metabolic Rate. H. J. Vandenberg, Grand Rapids, Mich.—p. 508.
- Pentothal Sodium Oxygen Anesthesia in Thyroid Surgery. C. N. Carraway, Birmingham, Ala., and T. C. Davison, Atlanta, Ga.—p. 514.

Diethylstilbestrol.—Wilson discusses the therapeutic results and side reactions in 202 women treated with diethylstilbestrol during the last two years and seen by him on the average of once a week while receiving the drug and for various periods thereafter. The average effective dose of diethylstilbestrol for the treatment of most symptoms of the climacteric is 1 mg. daily by mouth or 1 mg. intramuscularly twice a week. Topical applications of the drug in hydrous wool fat ointment is often effective for controlling pruritus vulvae and leukoplakic vulvitis. Mild recurrences within six weeks to six months were common, but resumption of topical therapy relieved the conditions. Diethylstilbestrol is more potent and less expensive, though possibly more toxic, than natural estrogens. Diethylstilbestrol is similar to other estrogens in that the favorable results that it elicits are rarely permanent. Nausea, vomiting and uterine bleeding were the chief side reactions among the 202 patients. As a rule they were transient, and complete withdrawal of the drug was not necessary. These and other side reactions subsided promptly after the drug was withdrawn. Women suffering from estrogen deficiencies tolerated larger doses of diethylstilbestrol with little if any gastrointestinal disturbance.

Mammary development and uterine enlargement were followed by irregular cycles of uterine bleeding in 3 or 4 cases of infantilism with primary amenorrhea.

Appendicitis.—Nichols attempts to evaluate some of the dangers that may accompany deferred operation in ruptured appendicitis. The greatest danger lies in the difficulty of diagnosing the exact preoperative state of the appendix. In his analysis of the data of 215 cases of acute appendicitis admitted to the Pfeiffer Surgical Clinic the author shows statistically what reliance may be placed on the usual diagnostic procedures, what diagnostic errors will be made and what results may be expected when signs and symptoms of acute appendicitis are present. The classification that he has adopted includes simple acute unruptured appendicitis, ruptured appendicitis with abscess formation and ruptured appendicitis with generalized peritonitis. When early operation has been undertaken in such cases, an average of between 1 in 5 and 1 in 10 of the acutely inflamed appendixes removed will be reported by the pathologist as chronically infected. If a diagnostic error is assumed in every case in which appendectomy was performed for acute appendicitis and the infection was chronic, the total error was 15 per cent. If those in which some concomitant pelvic pathologic change was found are excluded, the chronic cases have little to distinguish them from the acute group. Perhaps many of them were acute appendicitis with only minor abscesses, which were overlooked by the pathologist making only one section for microscopy. The series does not include some 35 or 40 cases of typical chronic appendicitis admitted over the same period. About one fifth of the diagnostic errors were made by 7 cases of ruptured ovarian cyst simulating appendicitis. In general, pathologic changes in the pelvis, excluding specific pelvic inflammatory disease, are apt to be more chronic than appendicitis. When a patient with some asymptomatic pelvic condition suddenly has an atypical attack of appendicitis, the possibility of diagnostic error increases. The inflammation of 8 such appendixes was "acute or subacute" and of 3 "chronic." There were 3 additional cases of acute appendicitis complicating pregnancy. Other cases in which exploration was done for possible appendicitis included 1 of lead poisoning, 1 of diabetes, 1 of mesenteric adenitis, 2 of pelvic inflammation, 1 of acute cholecystitis and 1 of pyelitis. Far more important than the nephroureteral, pelvic and miscellaneous conditions that may mimic appendicitis are the other more often fatal acute surgical diseases of the right lower abdomen, such as terminal ileitis, perforated ulcer, acute cholecystitis, strangulated hernia and omental torsion. The mortality is much higher among misdiagnosed cases of appendicitis than among the typical cases. Thus only 2 of the 5 fatalities among the author's series of patients were diagnosed correctly, the wrong diagnoses being perforated ulcer, acute infection of the gallbladder and strangulated hernia with reduction *en bloc*. Early operation with utilization of the best present day measures is a safer procedure for most surgeons than the deferred operation; the latter method should be reserved for use in institutions treating large numbers of cases of ruptured appendicitis under optimal conditions.

Exophthalmic Goiter.—Hertz and his associates discuss cases of exophthalmic goiter in which the ophthalmopathy and the thyrotoxicosis vary independently or inversely; that is, the thyrotoxicosis may be lessening or absent while the eyes are getting worse. In their experience these cases constitute perhaps 4 per cent of all cases of exophthalmic goiter. The treatment of such patients should be different from those having the classic form of the disease, as the eyes and not the thyrotoxicosis present the major therapeutic problem. Treatment should aim to relieve orbital swelling, not thyrotoxicosis, which may be absent, and it should not include only local measures but should attempt to break the vicious circle and restore hormone balance. More specifically, measures promoting depletion (thyroid hormone) seem indicated and those promoting water retention (thyroidectomy) seem contraindicated. However, sometimes a significant degree of thyrotoxicosis demanding treatment may coexist and then the thyrotoxicosis must be dealt with, when irradiation of the thyroid is preferable to ablation. The effect of irradiation is exerted slowly; thus there is more time for readjustment and the eyes are subjected to less risk of an acute exacerbation. Thyroidectomy should be resorted to only when the thyrotoxicosis cannot be controlled by other

means. Having made the diagnosis of this special ophthalmic type, the authors' usual treatment would be first to hold the basal metabolic rate as low as possible by iodine administration and to add to this as large a ration of thyroid as can be given without producing hyperthyroidism. The metabolic action of the two agents cancel out, but the desired diuretic action of thyroid is not opposed by iodine. The eyes must be safeguarded. Orbital decompression is indicated if and when the integrity of the conjunctiva or cornea is threatened or if vision is diminishing. This palliative procedure may be eye saving and even life saving. The prevalent ocular signs in the classic type of the disease are exophthalmos, lid lag, lid retraction and the usual signs described in the older literature. In the special type the accent is on edema and irritative phenomena, relatively slight proptosis, marked periorbital edema and chemosis of the conjunctiva, sometimes with massive swelling. Injection of the conjunctiva is common and the patient complains of smarting and excessive lacrimation. Often a thick ridge of edematous tissue above the upper lid, projecting like a finger toward the inner canthus, is present. Ophthalmoplegia and the resulting visual symptoms, such as diplopia, are common in the special type.

Wisconsin Medical Journal, Madison

40:553-652 (July) 1941

- Rowing Method of Artificial Respiration. M. C. Rosekrans, Neillsville.—p. 567.
- Laboratory Aids of Value in Diagnosis of Traumatic Shock and Internal Hemorrhage with Brief Reference to Use of Blood Plasma as Therapeutic Agent. C. S. Williamson, Green Bay.—p. 570.
- Congenital, Developmental and Acquired Characteristics of Spine and Their Relation to Injury. M. L. Jones, Wausau.—p. 574.
- Influenzal Meningitis Treated with Sulfanilamide and Spinal Drainage: Recovery. M. M. Baumgartner and T. O. Nuzum, Janesville.—p. 579.
- Comments on Treatment: Prevention of Bleeding in Newborn. A. J. Quick, Milwaukee, and M. H. Seevers, Madison.—p. 581.

Yale Journal of Biology and Medicine, New Haven

13:563-714 (May) 1941

- The Influence of Samuel W. Johnson on the Chemistry of Proteins. H. B. Vickery, New Haven, Conn.—p. 563.
- Germicidal Action of Hydrogen Ion and of Lower Fatty Acids. P. B. Cowles, New Haven, Conn.—p. 571.
- Brain in Experimental Vascular Disease. M. C. Winternitz, R. Katzenstein, E. Mylon, J. P. Murphy and H. M. Zimmerman, New Haven, Conn.—p. 579.
- Studies on Relation of Kidney to Cardiovascular Disease: III. Tissue Extracts and Thrombosis. M. C. Winternitz, E. Mylon and R. Katzenstein, New Haven, Conn.—p. 595.
- Investigation of Action of Manganese on Uterus Pertinent to Its Use in Dysmenorrhea. E. R. Smith, Meriden, Conn.—p. 623.
- Platybasia: Report of Two Cases. P. J. Laube, New Haven, Conn., and O. A. Turner, New York.—p. 643.
- Experimental Production of Apical Lesions of Teeth in Monkeys, and Their Relation to Systemic Disease. H. Genvert, New York; H. Miller, Philadelphia, and C. G. Burns, Brooklyn.—p. 649.
- Acute Pneumonitis: Report of Eighty-Seven Cases Among Adolescents. J. R. Gallagher, Andover, Mass.—p. 663.
- Experimental Tuberculosis in Mice. B. Gerstl and R. M. Thomas, New Haven, Conn.—p. 679.
- Vaccinal Infection of Fowls of Different Ages in Relation to Antiviral Power of Blood. F. Duran-Reynals, New Haven, Conn.—p. 693.
- Abnormal Findings in 246 Consecutive Autopsies on Monkeys. Margaret A. Kennard, New Haven, Conn.—p. 701.

13:715-892 (July) 1941

- Advent of Modern Medicine in Philadelphia, 1800-1850. R. H. Shryock, Philadelphia.—p. 715.
- New Frame for Metabolism. J. P. Peters, New Haven, Conn.—p. 739.
- Growth Inhibition Produced in Rats by Oral Administration of Sodium Benzoate: Effects of Various Dietary Supplements. A. White, New Haven, Conn.—p. 759.
- Acute Pneumonitis: Report of Epidemic. J. R. Gallagher, Andover, Mass.—p. 769.
- Changes in Field Properties of Mice with Transplanted Tumors. H. S. Burr, New Haven, Conn.—p. 783.
- Studies on Relation of Kidney to Cardiovascular Disease: IV. Tolerance and Pressor Agent of Kidney Extracts. M. C. Winternitz, E. Mylon and R. Katzenstein, New Haven, Conn.—p. 789.
- Tuberculosis and Tuberculin Tests in Subhuman Primates. Margaret A. Kennard and M. D. Willner, New Haven, Conn.—p. 795.
- Effect of Histamine Injections on Blood Eosinophilia in Allergic Patients. R. E. Kaufman, New York.—p. 813.
- Changes in Structure of Developing Tooth in Rats Maintained on Diet Deficient in Vitamin A. C. G. Burn, Brooklyn; A. U. Orton and A. H. Smith, Detroit.—p. 817.
- Röntgenologic Survey of Pelvis. H. Thoms and H. M. Wilson, New Haven, Conn.—p. 831.
- Reaction of Genital Tissues of Female Mouse to Local Application of Colchicine. W. L. Williams, New Haven, Conn.; Kathryn F. Stein, Holyoke, Mass., and E. Allen, New Haven, Conn.—p. 841.
- Objectives of Medical Education: Introduction to Consideration of Curriculum. S. C. Harvey, New Haven, Conn.—p. 847.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:217-254 (Aug. 16) 1941

- Anaerobic Cellulitis and Gas Gangrene. G. Qvist.—p. 217.
Further Observations on Antiseptic Snuffs. M. E. Delafield and Edith Straker.—p. 221.
Jugular Thrombosis After Tonsillitis. R. L. Flett.—p. 223.
Economy in Treatment of Impetigo and Scabies. R. W. Carslaw and J. A. Swenarton.—p. 225.
Root Vegetables as Antiscorbutics in Infant Feeding. D. M. Mathews and A. L. Bacharach.—p. 226.
Systemic Factors Influencing Wound Healing. W. G. Waugh.—p. 236.

Lancet, London

2:177-206 (Aug. 16) 1941

- *Further Observations on Penicillin: Growth, Assay, Production, Bacteriostatic Action, Effect on Cells, Absorption and Excretion and Therapeutic Trial. E. P. Abraham, E. Chain, C. M. Fletcher, A. D. Gardner, N. G. Heatley, M. A. Jennings and H. W. Florey.—p. 177.
Dry After-Treatment of Infected Hands. H. Bailey.—p. 189.
Plasma Utilization in Serum Processing. L. E. R. Picken.—p. 190.

Growth and Production of Penicillin.—Abraham and his colleagues discuss the bacteriostatic action of penicillin (a mold produced substance) against certain organisms that Chain and his co-workers described in 1940. The mold will grow and produce penicillin on a variety of mediums. The medium, sterilized by autoclaving, is sown with a spore suspension. Penicillin production is usually at its maximum at about pH 7. The pH , which rises slowly as the mycelium becomes more faded, is perhaps the most useful gage of the growth of penicillin, apart from an assay for antibacterial activity. The rate of development depends largely on the depth of the medium. After trying many types of containers for large scale production, the authors found a spout ceramic vessel 6 by 22 by 27.5 cm. satisfactory. The vessels are glazed on the inside. The production of penicillin is as follows: One liter of medium fills the vessels to a depth of about 1.7 cm. When a batch of vessels is first set up the medium (containing 10 per cent of yeast extract) is sterilized in the vessels, which are then inoculated with a few drops of a spore suspension and incubated at 24 C. Apart from an occasional test the vessels are not touched until the medium is ready to be harvested. The penicillin-containing fluid is withdrawn by suction from the vessels and replaced with fresh culture medium. Penicillin can be extracted from the culture medium by ether, amyl acetate or certain other organic solvents from an aqueous solution whose pH has been adjusted to 2. Batches of 3 liters of the penicillin-containing solvent are extracted with five successive amounts of 300 cc. each of water, baryta being used to adjust the pH to 6.5 or 7. After these extractions and filtering the penicillin is extracted back into pyrogen-free water saturated with ether, sodium hydroxide being used to adjust the pH . The strong aqueous ether extract is stable. It is stored as it is in the refrigerator or is dried by the lyophilic method and kept in a desiccator. The voluminous yellow penicillin powder is hygroscopic. In dispensing the material for intravenous injection it is assumed that the ether-containing solution is sterile. Before use most of the ether must be removed by suction.

Bacteriostatic Action of Penicillin.—The authors tested the in vitro bacteriostatic action of penicillin on many pathogenic organisms. Its bacteriostatic action resembled sulfonamide drugs, with the following differences: 1. The bacteriostatic power of penicillin against streptococci and staphylococci is much greater. Saturated watery solutions of sulfapyridine and sulfathiazole show no complete inhibition on an assay plate, whereas penicillin at 1:500,000 gives an appreciable clear zone. 2. The action of penicillin on streptococci and staphylococci, unlike that of the sulfonamides, is influenced to only a minor extent by the number of bacteria present. Even when several million staphylococci or streptococci are present in 1 cc. of medium their multiplication is completely inhibited by penicillin in a concentration as low as 1:1,000,000, while in heavily infected wounds the sulfonamide drugs seem to have but little effect. 3. In suppurating wounds the bacteriostatic power of

penicillin against streptococci and staphylococci, contrary to the sulfonamides, is not antagonized by hydrolytic protein breakdown products or products of tissue autolysis or pus.

Effect on Cells and Tissue of Penicillin.—Penicillin in a concentration of 1:500 did not appear to embarrass leukocyte activity in vitro. Leukocytes will remain completely active in any concentration of penicillin likely to be reached after intravenous injection. The effect of local application has been tried on tissue of the central nervous system of 2 rabbits under pentobarbital sodium anesthesia. Neither rabbit showed any functional disturbance after the anesthetic wore off. Its effect on the cerebral tissue of 3 rabbits was studied, and again no lesions attributable to the penicillin were discovered. These results, in conjunction with those on leukocytes, strongly suggest that local application of strong solutions of penicillin should prove innocuous to tissue cells.

Absorption and Excretion of Penicillin.—According to Abraham and his colleagues, penicillin is absorbed after subcutaneous injection in mice, from the intestine in rats, and antibacterial activity appears in the urine secreted subsequently. Its absorption and excretion have been further investigated on rabbits, cats and man. No activity could be detected in the blood of the rabbit at the end of half an hour after 400 units intravenously, while in the cat after the same dose the blood was antibacterial for at least one and a half hours. After duodenal introduction there was no activity in the blood and little in the urine of the rabbit, whereas in the cat activity could be detected in the blood and there was considerable excretion. Man appears to be in both instances more like the cat. By whatever route penicillin is administered, not all the active substance appears in the urine. It is not clear where this "loss" occurs. It is not known whether the material excreted in the urine is changed in any way. It still has a high antibacterial titer and has been used again for injection into patients without ill effect. Material partially purified but containing pyrogen is freed from this impurity by passage through the body.

Clinical Use of Penicillin.—Penicillin was administered intravenously to 6 patients with staphylococcal or streptococcal infections and locally to 4 patients with ocular inflammations. Five of the first 6 patients had previously been given various forms of chemotherapy and some also had received surgical treatment. They were patients for whom no further treatment likely to be of benefit could be proposed. After treatment with penicillin the temperature fell and the general and local condition improved. Recrudescence was attributed to insufficient penicillin. The patients' spirits and appetite were greatly improved during treatment. Local application gave equally promising results. The authors believe that enough evidence has been assembled to show that penicillin is a new and effective type of chemotherapeutic agent and that it possesses two properties not had by any other antibacterial substance—low toxicity to tissue cells and powerful bacteriostatic action. It prevents growth of a wide range of bacterial species, some of the most common and destructive organisms with which man may be infected. Its bacteriostatic action is interfered with in no way by body fluids or pus and only to a limited extent by heavy infections.

2:207-236 (Aug. 23) 1941

Morbid Red Cell Development and Treatment of Anemia. M. C. G. Israëls.—p. 207.

*Motor Neuron Degeneration Treated with Vitamin E. C. Worster-Drought and J. Shafar.—p. 209.
Modified Insulin Therapy in War Neuroses. W. Sargent and Nellie Craske.—p. 212.

Acute Ulcerative Stomatitis: Three Unusual Cases. C. H. A. Walton, H. M. Graham and L. P. Lansdown.—p. 214.

Calcium and Phosphorus Studies in Myxedema. J. D. Robertson.—p. 216.

Vitamin E for Nervous Disorders.—Worster-Drought and Shafar gave daily 18 or 30 mg. of vitamin E (α -tocopherol acetate) to 25 patients with motor neuron degeneration (progressive muscular atrophy, amyotrophic lateral sclerosis and lesions of the pyramidal tract or progressive bulbar paralysis). Treatment lasted for five to ten months. Animal studies show that muscular dystrophy and degenerative changes in the central nervous system may develop as a result of vitamin E deficiency. The nature and extent of the lesions vary with the class and age of the animal. Among the 25 patients there were 9 with

bulbar paralysis showing the usual symptoms of dysarthria and dysphagia, with glossolabial paralysis and various degrees of spinal motor neuron degeneration; that is, atrophy of the intrinsic muscles of the hands, fibrillation in some groups of muscles or early paraplegia with extensor plantar reflexes. While still under treatment 3 of these patients died, and in the other 6 a steady increase in paralysis was noticed even during treatment: only 1 patient showed some improvement in well-being in spite of a progressive neurologic condition. Of the 9 patients with progressive muscular atrophy treated for six to nine months, the disease in 5 progressed, there was no change in the symptoms or physical signs of 1, in 2 there appeared to be some improvement in gait with a raised level of general health, and 1 case remained more or less stationary but with a more cheerful outlook. Of the 7 patients with amyotrophic lateral sclerosis in whom paraplegia of upper neuron type was the predominant clinical manifestation, 5 showed evidence that the disease was steadily advancing (1 in spite of some advance in muscular atrophy had a striking amelioration in general health and mental outlook), and in 2 the clinical condition had definitely improved. The authors assume that the favorable response in the spastic paraplegia and muscular atrophy was due to the vitamin E therapy. Psychologic factors may have somewhat influenced the improvement of 1 of the patients. The unexpected and pronounced favorable effect on the general vitality and emotional tone in 9 of the 25 patients might partly be attributed to the institution of a definite line of treatment, but it is also possible that vitamin E may act as a stimulant to general health and give rise to a feeling of well-being in states of depression. The authors believe that Bicknell's statement "that vitamin E appears to be one of the great advances in general medicine of the century" is premature. The therapy is in too early a stage to draw any definite conclusions, and its value in neuromuscular disorders remains speculative.

Ophthalmologica, Basel

101:257-320 (May) 1941

- *Cystine Disease During Childhood with Special Reference to Ocular Changes. E. Bürki.—p. 257.
Investigations on Etiology of Trachoma. S. Ochi.—p. 272.
Curvature of Eyeball and Taking Casts of Living Eye for Preparation of Contact Glasses. G. Mihályhegyi.—p. 290.

101:321-380 (June) 1941

- Uveomeningitic Syndrome: Study of Harada's Disease. A. Rubino.—p. 321.
*Cystine Disease During Childhood with Special Reference to Ocular Changes. E. Bürki.—p. 331.
Investigations on Etiology of Trachoma. S. Ochi.—p. 355.
Temporary Deformation of Pupil after Accidental Local Contusion of Eyeball. A. Bakker.—p. 364.

Cystine Disease with Ocular Symptoms in Childhood.—Bürki discusses a boy with a disturbance in the cysteine-cystine metabolism (cystine storage disease). The clinical aspects of the disease were those of renal dwarfism or renal rickets. The general examination revealed nothing which would indicate the true nature of the disease. The ophthalmologic examination disclosed crystalline deposits in conjunctiva and cornea which had never been described hitherto. Microchemical examination of an excised piece of conjunctiva militated strongly for the cystine nature of the crystals. Thus it was the eye examination which made probable the diagnosis of cystine disease. The boy died of uremia. The pathologic-anatomic, histologic and chemical examinations corroborated the suspected clinical diagnosis of cystine diathesis with renal dwarfism or severe renal rickets, chronic glomerular and interstitial nephritis, terminal uremia, heavy cystine deposits in the mesenchyma of many organs, particularly the eyes, and storage in the reticuloendothelial system. The cystine diathesis is probably caused by a lack or by deficient decomposition of cysteine (deamination). The resulting excess of cysteine and cystine in the growing organism causes severe sequels, such as dwarfism, chronic nephritis with secondary renal rickets and uremia. It is to be assumed that among the earlier reported cases of renal dwarfism, particularly of the infantile form, there were cases of defective cysteine-cystine metabolism. Slit-lamp examination of the cornea would doubtless be valuable in the differential diagnosis of such cases.

Schweizerische medizinische Wochenschrift, Basel

71:677-700 (May 31) 1941

- *Contribution to Knowledge of So-Called Idiopathic Choledochus Cyst. J. Bangerter.—p. 677.
Electrocardiographic Changes During Icterus. M. S. Meier.—p. 679.
Contribution to Physiology and Pathology of Erythrocytes. C. Dreyfuss.—p. 682.
Normal Capillary Fragility in Human Subjects: New Method of Determination. A. Tey.—p. 685.
Investigations on Action of Antineuralgic Preparations on Cutaneous Sense Organ of Human Subjects. E. Grunthal.—p. 689.
Simple and Practical Method of Exploration of Ureosecretory Function of Kidney: Hemato-Urinary-Ureal Ratio of Cottet. R. Junet and G. Meyrat.—p. 690.
Lymphosarcoma and Feeding with Irradiated Dry Milk. W. Hoffmann.—p. 695.

71:733-756 (June 14) 1941. Partial Index

- *Contribution to Knowledge of So-Called Idiopathic Choledochus Cyst. J. Bangerter.—p. 733.
*Chemotherapy of Wounds by Preparation 4029-9 (a Sulfanilamide Derivative). A. Jentzer and R. Madjzoub.—p. 737.
Experiences with Sulfathiazole in Pediatrics. W. Trachsler.—p. 744.
Roentgenologic Aspects of Small Intestine in Nontropical Sprue. H. W. Hotz and W. G. Deucher.—p. 748.
Cholinesterase and Mono-Aminoxydase in Central Nervous System. H. Birkhäuser.—p. 750.

Idiopathic Choledochus Cyst.—Bangerter reports two cases of idiopathic cyst of the choledochus, a circumscribed, ampulla-like dilatation of the median and upper portions of the duct. This is not to be confused with a general cylindric dilatation observed in mechanical obstruction. The difference is important because it constitutes evidence against the theory of mechanical pathogenesis of the idiopathic cyst. A congenital malformation is assumed to be the cause of an idiopathic cyst. Secondary causes are required to stimulate the growth of the congenital dilatation and to produce symptoms. Stenosis of the distal portion of the choledochus, which is likewise often congenital, is one of the most important. Functional disturbances such as dyskinesia, hypertension or spasms of the sphincter of Oddi or of sphincter papillae may cause repeated mild stasis and thus enlarge the congenital cyst and gradually produce symptoms. Inflammation may also play a part. Abnormalities in the distal portion of the duct, such as abnormal direction, sharp bends, valves and folds, are not causes but rather results of the cyst. In the author's first case there was, in addition, a cyst of the pancreas. This suggests a common etiology and a close relationship in the development of both ducts. Diagnosis of idiopathic dilatation of the common bile duct is difficult because of the variability of the clinical picture. Typical cases are characterized by tumor and pain in the right epigastrium and by icterus. Icterus is the most constant symptom. Acute peritoneal symptoms are present when the cystic contents are infected. The general condition is often severely impaired. The onset is frequently insidious. Echinococcosis of the liver, pancreatic, retroperitoneal or ovarian cysts, hydro-nephrosis, pregnancy, and gallstones are to be considered in the differential diagnosis. Surgery offers the only effective therapy. Puncture has been abandoned because it may cause peritonitis and is ineffective. Two stage choledochoduodenostomy has a high mortality. Total extirpation of the dilated portion of the duct with hepatoduodenostomy may exceptionally produce a cure but is too radical in the presence of an impaired general condition. Anastomosis of the hepatic duct with the duodenum and reduction of the cyst by puckering sutures taxes the patient less. Best results have been obtained with anastomosis of the cyst with the gastrointestinal tract. In the author's first case the cyst was anastomosed to the stomach, but the patient died from intestinal hemorrhage three days later. In the second case the gallbladder was removed because it was considered the primary seat of infection. The cyst was drained by an external fistula. The patient made a recovery.

Chemotherapy of Wounds by Sulfanilamide Derivative.—Jentzer and Madjzoub report on local application in wounds in 225 cases of a derivative of sulfanilamide in which the 4-amino group is replaced by a soluble product. The sulfanilamide constituted 10 per cent of the compound. The drug was applied in doses of from 5 to 20 Gm. after surgical care of the wound. Treatment of accidental wounds (open fractures, wounds caused by projectiles and so on) has been transformed

by the local application of sulfanilamides. Primary suture became the method of choice. In the treatment of wounds which do not permit of primary suture (wounds produced by bombs, grenades, bites, and so on) a delayed primary suture can be practiced after a few days of treatment with the drug. The method does not always prevent an infection, but it at least retards its development. It changes the problem of evacuation in military surgery. Many of the injured treated with sulfanilamide can be sent directly to hospitals in the rear. Painful daily dressings are obviated. Results obtained by the authors are extremely encouraging, although there exist contraindications to this treatment. Blood tests demonstrated that the chemotherapeutic agent is absorbed from the wound, the absorption being slower in older wounds. The drug, in such cases, may be supplemented by intravenous or intramuscular injections or by oral administration. The mode of action of sulfanilamides is probably that of local bacteriostatic effect.

Minerva Medica, Turin

1:429-452 (May 4) 1941. Partial Index

*Histamine in Stagnant Gastric Secretion After Resection: Role of Histamine in Pathogenesis of Gastroduodenal Ulcer and Postoperative Disease. L. Businco and Renato Scoccianti.—p. 429.

Histamine in Stagnant Gastric Secretion After Resection.—Businco and Scoccianti maintain that an increased amount of histamine in the blood is an etiologic factor in gastroduodenal ulcer. Symptoms of the postoperative sickness, such as collapse, peripheral hypotension, changes in blood chemistry and acidosis, are paralleled by experimental histamine poisoning. Gastric secretion in patients with gastroduodenal ulcer, twenty-four hours after gastric resection, presents an abundant highly toxic dark fluid stagnating about the seat of resection unless withdrawn by aspiration. The authors studied patients with gastroduodenal ulcer before and after gastric resection. They found the amount of histamine in the blood to be increased before the operation and twenty-four hours after it, the figures of the last determination being lower than those of the first. The amount of histamine in the stagnant fluid rose slowly during the first ten hours after resection and more rapidly between the tenth and twenty-fourth hours, after which it slowly diminished. The highest figures varied between 0.006 to 0.02 mg. of histamine for each cubic centimeter of the fluid. The authors believe that the toxicity of the stagnating fluid is due to its histamine content mobilized from the gastric walls by the operative trauma and stimulation of secretion. The postoperative sickness is a form of a histamine poisoning which results from gastrointestinal absorption of the stagnant fluid. The authors stress the importance of postoperative aspiration of the gastric contents in order to prevent postoperative sickness.

Archivos Argentinos de Pediatría, Buenos Aires

16:1-106 (July) 1941. Partial Index

Probable Splenoportal Thrombosis with Roentgenographic Studies of Esophageal Varices. R. C. Aguirre, M. Bekel and J. R. Calcarani.—p. 3.

*Nicotinic Acid and Stomatitis Aphthosa. J. Damianovich and R. Ravizzoli.—p. 21.

Adamantinoma of Hypophysis. C. C. Lugones and A. A. Ferraris.—p. 31.

Mediastinal Syndrome Caused by Lymphoblastic Sarcoma. C. Figoli and F. J. Menchaca.—p. 43.

Nicotinic Acid and Stomatitis Aphthosa.—Damianovich and Ravizzoli treated buccal aphthae and stomatitis aphthosa by oral administration of nicotinic acid. All but 3 of the 15 patients were children. The daily quantity of nicotinic acid varied between 75 and 200 mg. and was divided into three or four doses. The tablets were powdered and were given with sugar, sweets, compotes or puréed fruits. The medication was well tolerated. Beneficial results were evident after the first few doses, and a cure was usually accomplished in three days. There was rapid epithelization of the lesions, the burning was eased, the discharge diminished and alimentation normalized. Gingivitis was more refractory and required the use of astringents. Vitamin B was not administered. The nicotinic acid therapy did not cause nausea, vomiting or intestinal cramps.

Bol. Inst. de Med. Exper. p. Cancer, Buenos Aires

18:1-480 (April) 1941. Partial Index

*Cancer Producing Tar in Maté Herb. A. H. Roffo.—p. 5.
Blood Transfusion in Cancer. A. H. Roffo and H. V. Montagna.—p. 201.

Cancer Producing Tar in Maté Herb.—The tea of maté herb is a stimulating drink like coffee. Roffo found that the herb yields on pyrogenic distillation a cancer producing tar similar to that which can be obtained from tobacco, coffee and tea. The cancerigenic effect of the substance was verified in experiment. Drinking maté tea, however, is not dangerous for the population because the leaves of the herb are dried at a temperature which does not reach that which would be necessary for the production of hydrocarbons and because the hydrocarbons of the maté tar are not soluble in water.

Bol. Oficina San. Panamericana, Washington, D. C.

20:773-886 (Aug.) 1941. Partial Index

*Chediak Microreaction for Syphilis: Its Value in Public Health. A. Diaz Albertini, A. Recio and G. Lage.—p. 792.

Chediak Microreaction.—According to Diaz Albertini and his collaborators, the Chediak microreaction for the diagnosis of syphilis differs from the classic serologic flocculation tests mainly in that it may be made with dried, defibrinated blood. It does not require a venous puncture, the technic is simple and the material is readily available and inexpensive. The brief time (five to ten minutes) necessary for the reaction makes its use advantageous in emergencies, as for example in the selection of donors. The test has been tried in several hundred thousand cases in the last eight years in several countries. In the Municipal Maternity Hospital of Habana, 33,000 Chediak tests have been made and the results coincided with those of the Kahn and Meinicke reactions. A large drop of blood is placed on a slide and the blood is gently agitated in order to defibrinate it for half a minute, the corner of a slide or a lancet being used. The slide is dried at room temperature, in an oven at 38 C. or under a lamp. The necessary reagents are a 3.5 per cent sodium chloride solution and Meinicke's antigen (M. K. R. II). To dilute the latter for immediate use, 2 cc. of 3.5 per cent salt solution is placed in a clean, dry test tube, and 2 cc. of the antigen in another; both are heated on a water-bath at 56 C. for five minutes; the salt solution is poured over the antigen and is kept on a water bath for two minutes at the same temperature. Next the tube is removed and the antigen is distributed with a pipet so that each drop amounts to 0.03 cc. of the diluted antigen. The dried blood specimen is dissolved by adding 0.02 cc. of the 3.5 per cent salt solution with a graduated pipet, the blood being stirred with the edge of a slide. A slide with a paraffin ring 1.5 cm. in diameter may be used instead of the hollowed slide. To the dissolved blood is added 0.03 cc. of the recently prepared dilute antigen. Reading with a low power dry objective and a No. 10 ocular may be made after shaking of the slide for five minutes. A uniform field free from granules will be seen if the result is negative. In a positive reaction black granules of different sizes are observed. The degree of the reaction is interpreted according to the size and time of appearance of the granules. Care must be taken not to confuse the brown or yellowish grains of undissolved fibrin with the black granules of the positive reaction.

Bol. y Trab., Acad. Argent. de Cir., Buenos Aires

25:733-806 (No. 15) 1941. Partial Index

*Primary Pancreatitis from Mumps: Case. R. Velasco.—p. 738.

*Aspiration Biopsy for Diagnosis of Diseases of Body of Vertebra. J. Valls, C. E. Ottolenghi and F. Schajowicz.—p. 743.

Primary Pancreatitis from Mumps.—A man exposed to a patient with mumps contracted fifteen days later fever and symptoms of acute edematous pancreatitis in the course of which mumps became evident. There developed conjunctivitis and neuritis. Treatment consisted in sulfathiazole 6 Gm. daily. Neuritis was controlled by administration of thiamine hydrochloride.

Aspiration Biopsy of Vertebra.—Valls and collaborators describe a technic of a biopsy of the body of a vertebra performed under roentgenologic control. Puncture is done by the

Kappis and Böhler technic of anesthesia of the splanchnic and of the body of a vertebra. By this technic biopsy can be safely made of any of the vertebrae. The authors report on biopsies in 19 cases followed by microscopic studies of the material obtained. Among the diagnoses made were those of cancer metastases, myeloma, tuberculosis, hydatid disease, senile osteoporosis and nonspecific chronic inflammation. The procedure is not dangerous.

Revista de la Asoc. Med. Argentina, Buenos Aires
55:427-504 (June 15-30) 1941. Partial Index

*Lung in Whooping Cough: Roentgen Aspects. R. Maggi.—p. 427.

*Action of Estrogen on Hyperthyroidism. F. F. Rocca and A. G. Falcone.—p. 434.

*Ulceration of External Iliac Vein and Artery as Rare Postoperative Complication of Gangrenous Appendicitis: Case. E. L. Ottolenghi.—p. 465.

Lung in Whooping Cough.—According to Maggi pure whooping cough is a pulmonary disease. The roentgen changes of the lung in uncomplicated whooping cough are different from those observed when complications are present. Serial roentgen studies of a large group of cases of the disease without complications revealed lung shadows in 50 per cent of mild cases and in all of the severe cases. Pathologic changes appear during the third and fourth week of the disease. The extent and the depth of the shadows and their duration in the roentgenograms depend on the severity and the duration of the disease. Perimediastinal and infrahilar shadows were most frequent. A triangular shadow with its base on the cupula of the diaphragm and its apex at the hilar region was frequent. One also observed triangular shadows with the base in the mediastinal region and the apex at the periphery. The shadows are bilateral but differ from one another. Those of the left lung deform the heart shadow, giving it an irregular outline. Inflammation of the pleura occurs frequently. It appears in the roentgenogram as a fissuritis (the "spur-like" shadow). The roentgen shadows of the lung in whooping cough, especially the triangular ones, although not characteristic, can be differentiated from those of atelectasis and bronchiectasis. The character of the cough, the clinical symptoms and the course of the disease must be considered in the diagnosis. Bronchography is valuable in the diagnosis of whooping cough and bronchiectasis. Roentgenograms of patients with bronchopneumonia complicating whooping cough are similar to those of patients with the severe uncomplicated forms of the disease. Roentgenograms of uncomplicated whooping cough are different from those of pulmonary tuberculosis. The tuberculin test in the course of and after the whooping cough may give positive results in the absence of tuberculosis due to anergy from whooping cough. The absence of tubercle bacilli in the sputum and in gastric washings confirms the diagnosis of whooping cough.

Action of Estrogen on Hyperthyroidism.—Rocca and Falcone administered estrogen in doses of 50,000 international units twice a week for six weeks to three months to patients with thyroid disease. The substance appeared to have a favorable effect on hyperthyroidism, especially in moderate cases without goiter or with nontoxic nodular goiter. Best results were obtained in cases of hyperthyroidism complicated by menstrual disorders due to ovarian deficiency. Estrogen therapy combined with iodine relieved symptoms of exophthalmic goiter and brought about a remission of the disease.

Ulceration of the External Iliac Vessels in Gangrenous Appendicitis.—Ottolenghi reports the case of a boy aged 7 years in whom removal of a gangrenous appendix was followed one week later by a hemorrhage from the wound. Tamponade and transfusion of 300 cc. of blood controlled the bleeding. Five days later another, more serious hemorrhage took place. After an intracardiac transfusion of 800 cc. of physiologic solution of sodium chloride followed by intracardiac transfusion of 250 cc. of blood, the external iliac artery and vein were ligated. Four hours later 200 cc. of blood was transfused. The boy recovered. The manifestations of dry gangrene in the leg caused by ligation of the artery receded in time. Proper orthopedic management resulted in a useful limb. Examined five years later, the limb was found to be somewhat thinner than the opposite one, somewhat lame but useful.

Revista Médica de Chile, Santiago
69:363-426 (July) 1941. Partial Index

*Associated Arsphenamine, Bismuth and Insulin in Dementia Paralytica. A. Morales San Martin.—p. 380.

Insulin in Dementia Paralytica.—Morales San Martin resorted to insulin therapy in 10 cases of dementia paralytica in which malarial therapy failed. Treatment consisted in 10 to 30 units of insulin for ten consecutive days followed by administration of insulin in the course of antisyphilitic therapy. Insulin was administered in doses sufficient to cause hypoglycemia without causing coma. It was not administered on the day on which arsphenamine was given. The author found that insulin has a sedative effect and that patients with dementia paralytica are more sensitive to the action of insulin than patients with schizophrenia. A cure was obtained in 5, improvement in 2 and failure in 2. Insulin appears to improve the general condition, to stimulate general organic defenses and to increase the permeability of the meninges to antisyphilitic drugs. The latter results in a better utilization of drugs by the nervous tissue.

Revista Mex. de Cir., Ginec. y Cancer, Mexico City
9:211-264 (June) 1941. Partial Index

Intravenous Anesthesia by Pentothal Sodium. C. Zuckermann and F. Villar Andrade.—p. 211.

*Endocrine Therapy by Blood Transfusion. F. Rodea Gómez.—p. 223.

Endocrine Therapy by Blood Transfusion.—Customary treatment and various hormone preparations having failed to improve a case of severe metrorrhagia, Rodea Gómez resorted to blood transfusion. The blood was taken from a woman one or two days past her menstrual period. The first transfusion did not exceed 50 cc. because of a technical error, but the hemostatic effect was evident within twenty-four hours. Two days later the patient was given an additional 70 cc. This transfusion was followed by complete arrest of the hemorrhage. During the following menstrual cycles transfusions were resumed and the menstrual flow was finally normalized. The author used this treatment in 6 similar cases and was able to control severe hemorrhages and regulate the menstrual cycle.

Medizinische Klinik, Berlin

37:525-548 (May 23) 1941. Partial Index

Sexual Function of Hypophysis. W. Büttner.—p. 525.

Oliguria and Anuria in Unilateral Closure of Ureter. J. Cremer.—p. 529.

Syphilis and Pernicious Anemia. W. Lorenz.—p. 531.

*Immunizations Against Typhus. R. Wohrlab.—p. 532.

Experiences with Oily Suspension of Bismuth in Treatment of Influenza. G. Zippel.—p. 535.

Immunizations Against Typhus.—Wohrlab reviews attempts at preparation of effective vaccines against typhus, pointing out that experiments with living vaccines did not yield practical results. The first vaccines prepared with killed rickettsiae likewise were not sufficiently effective. Weigl produced an effective vaccine by infecting lice by means of anal claspers. This method enabled him to infect lice in the absence of typhus patients. After the lice had been infected, they were fed for from eight to ten days on typhus convalescents. The vaccine was prepared from the stomachs of the lice. This vaccine is injected three times in five days. It proved its value in Poland, in China and in Ethiopia. The protection it confers persists for from one to two years. Since the preparation of this louse vaccine is somewhat complicated, search was made for simpler methods for the multiplication of rickettsiae. Coxé's method of utilizing the vitelline sac of the chick embryo proved most satisfactory and was used by Otto for mass production of *Rickettsia prowazekii*. The former method of killing by heating to 60 C. has been abandoned because it impairs the antigen. Immunization is done by injecting the vaccine three times (once 0.5 cc. and twice 1 cc.) at five day intervals. It was demonstrated on guinea pigs that the vaccine obtained by the chick embryo method has the same degree of efficacy as has the louse vaccine of Weigl. However, the growth of rickettsiae is not always uniform in eggs, making it advisable to continue Weigl's method as well. It may become possible to improve the quality of vaccine after further research on the immunizing constituents

of rickettsiae that go into solution (perhaps toxins). Protective effects could be obtained with extracts from egg yolk and cell culture filtrates that were practically free from rickettsiae. Experiments were made also with a vaccine of Rickettsia mooseri, but the heterologous immunity produced by it is somewhat inferior. The production of immune serum in horses has been satisfactory only with Rickettsia mooseri. The use of pooled convalescent serums was tried last year in Poland but proved ineffective.

37:549-572 (May 30) 1941. Partial Index

- Diagnosis of Cutaneous Diseases. W. Krantz.—p. 549.
*Estimation of Silicosis Associated with Tuberculosis on Basis of Insurance Law. A. Winkler.—p. 552.
Sexual Function and Hypophysis. W. Büttner.—p. 555.
Causal Therapy of Senile Colpitis. K. Veselý.—p. 558.

Silicosis and Tuberculosis.—Winkler aims to clarify regulations of the insurance law with regard to compensation in cases of concurrence of silicosis with tuberculosis. Silicosis associated with tuberculosis is to be regarded as an occupational disease and subject to compensation only if (1) the silicotic organic changes are so pronounced that the existence of silicosis as a basic disease can be recognized, and when it can be demonstrated that silicosis is the cause of the active progressive course of pulmonary tuberculosis; (2) if tuberculous changes are present whose etiology, activity, or its exacerbation by the concurrence with silicosis cannot be doubted. The author differentiates three stages of silicosis. The first is characterized by intensification of the shadow in the region of the root of the lung, by streaklike perihilar strands and later by diffuse reticular or meshlike markings. There is also stippling or spotting. These symptoms are not pathognomonic for silicosis since they may occur in chronic bronchitis, bronchiolitis, stasis and certain forms of pulmonary tuberculosis. Many authors refer to this stage as "dusty" lung to indicate that it is not necessarily silicotic in origin. It is the etiologically undifferentiated preliminary or developmental phase. Diagnosis of silicosis with tuberculosis is possible only if the silicotic nature of the alterations cannot be doubted and an active pulmonary tuberculosis is present. Thus, the first or etiologically undifferentiated phase of silicosis cannot be regarded as "demonstrable" silicosis in the meaning of the insurance law. Only the second and third stages can be regarded as such. The second stage is the granular stage, characterized by "granular" lung. The third stage is characterized by induration or conglobations in the lung and is designated as the conglobation stage of silicosis.

Medizinische Welt, Berlin

15:445-472 (May 3) 1941. Partial Index

- Should Apparatuses (Zander's) Still Be Used in Treatment of War Injured? L. Frosch.—p. 445.
Errors and Dangers in Injections. R. Goldhahn.—p. 447.
Modern Finsen Treatment of Lupus. P. Jordan.—p. 452.
*Relations Between Pulmonary and Cutaneous Tuberculosis. K. Kalkoff.—p. 454.

Relations Between Pulmonary and Cutaneous Tuberculosis.—Kalkoff believes that in nearly all patients with cutaneous tuberculosis a tuberculous infection of the lungs has existed even though it is no longer demonstrable with the customary methods of examination. Inactive and active pulmonary processes are considerably more frequent in patients with tuberculosis of the skin than in persons free from such lesions. Whether the ratio of inactive to active pulmonary processes is different in patients with tuberculosis of the skin and whether the course of pulmonary tuberculosis in them differs from that in patients with a healthy skin cannot be definitely ascertained. The fact that a large percentage of patients with cutaneous tuberculosis die of pulmonary tuberculosis does not suggest a milder course of pulmonary tuberculosis in these patients. The assumption of an actively immunizing action of cutaneous tuberculosis cannot be supported by the available serologic test methods. The existence of a certain reactive condition of the organism must be regarded as the determining factor in the development and course of the different tuberculous manifestations.

Münchener medizinische Wochenschrift, Munich

88:617-640 (May 30) 1941

- *Dysentery Bacteriophages. H. Kliewe and W. Helmreich.—p. 617.
*Follicular Hormone in Leukopenia. H. Cramer and H. Brodersen.—p. 619.
*Vitamin K in Surgery. R. Zenker and H. Meurer.—p. 622.
Dwelling-House and Health. F. Hamburger.—p. 624.
General Consideration of Short Wave Therapy. E. Schliephake.—p. 626.
Effect of New Sulfanilamide Preparation Tibatin (Galactoside of 4,4-Diaminodiphenylsulfone). H. Kämmerer.—p. 630.

Dysentery Bacteriophages.—Kliewe and Helmreich believe that opinions about the value of bacteriophages in dysentery are divided, because bacteriophages differ in efficacy. It has been found that not only the bacilli vary in different epidemics and endemic foci but probably also the bacteriophages. In Poland the authors observed that local strains of bacteriophages produced lysis in all strains of dysentery bacilli obtained locally, whereas bacteriophages brought in from Germany did not do this. Thus it seems highly important to use a potent polyvalent mixture of bacteriophage that has been produced from locally obtained strains. The authors tested the prophylactic value of bacteriophage mixtures prepared by themselves on 113 soldiers who were exposed to dysentery. These men were given on three successive mornings on a fasting stomach a dose of sodium bicarbonate followed by 10 cc. of the bacteriophage mixture in half a cup of tea or coffee; 250 men belonging to the same unit were left untreated to serve as controls. In the course of the following eight weeks, 10 of the 250 controls had dysentery, but not a single man among the 113 who had received prophylactic treatment with bacteriophages had the disease. The therapeutic value of the bacteriophage mixture was demonstrated in the course of an epidemic in which the customary treatment was given. The administration of 10 cc. of bacteriophage mixture on each of the first three days was the only specific treatment. It proved particularly effective in cases of mild and of moderately severe Flexner-Y dysentery. Patients with severe dysentery frequently showed an exacerbation and only occasionally improvement. This may be due to the fact that in the severely impaired intestine the bacteriophages cannot exert their influence, but it is probable also that the toxins liberated by the bacteria exert an unfavorable influence on the disease process. Bacteriophage therapy in the cases of severest dysentery requires further investigation. Bacteriophages were used also in carriers, in men whose feces contained Flexner bacilli four weeks after complete recovery. The dysentery bacilli disappeared in 16 such carriers after they had received bacteriophages on three successive days.

Estrogenic Substance in Leukopenia.—Cramer and Brodersen cite a previous report by Cramer in which attention was called to a constant increase in the leukocyte count during the premenstrual phase in a case of myeloid leukemia. This induced Cramer to try estrogenic substance in an instance of intractable leukopenia caused by aminopyrine. Since this proved successful, he resorted to estrogenic therapy in cases of leukopenia from varied causes. In only 1 case could the condition be definitely identified as granulocytopenia, but in all cases there existed a leukopenia which responded to treatment with estrogenic substance. Patients with the following conditions were treated: hypersensitivity to aminopyrine, leukopenia after roentgen irradiation, pernicious anemia with severe leukopenic reaction, Hodgkin's disease with leukopenia and typical granulocytopenia. The case of Hodgkin's disease is cited because it demonstrates the action of estrogenic substance on the granulopoiesis in a man. The authors regard this treatment as one of clinical utilization of a hormonal regulating process. It suggests a relation between ovarian function and bone marrow which was suspected long ago by Nägeli and other investigators.

Vitamin K in Surgery.—According to Zenker and Meurer the prothrombin content of the blood which permits estimation of the vitamin K economy in the organism can be determined with different methods, but that of Quick is the most suitable for clinical purposes. It suggests the existence of a tendency to hemorrhage. A prothrombin content of more than 75 per cent of normal involves no danger of hemorrhage, but values of less than 50 per cent must be regarded as pathologically

reduced, and with values between 20 and 30 per cent the danger of hemorrhage is especially great. Reports published so far indicate that hypoprothrombinemia and its control by vitamin K is particularly important in the hemorrhagic diathesis of the newborn. Investigations by Zenker and Meurer aimed to determine to what extent vitamin K deficiency exists in surgical conditions, whether hypoprothrombinemia is always accompanied by a hemorrhagic tendency and to what extent it can be compensated by vitamin K. Their studies were made on 36 patients. The disorders represented were various types of jaundice, biliary and hepatic disorders without jaundice, hemorrhages and diseases of the blood, cachexia and intestinal and miscellaneous disturbances. It was found that the prothrombin deficiency which develops in obstructive jaundice, in hepatic impairments, in severe hemorrhages and in resorption disturbances of the intestine can be compensated by the administration of vitamin K. The vitamin K is administered by injection. The authors give 1 cc. daily, continuing this dose for three or four days in mild cases and for six to eight days in severe cases.

Wiener klinische Wochenschrift, Vienna

54:381-400 (May 2) 1941. Partial Index

Sport and Defensive Forces. A. Lorenz.—p. 381.

*Therapy of Genuine Lipid Nephrosis. V. Lachnit.—p. 388.

*Studies with Fermo Serum and with Aphylacto Serum in Children Sensitized to Horse Serum. E. Pöhacker-Fritsch and J. Siegl.—p. 391.

Significance of Hysterosalpingography in Estimation of Sterility. H. Tasch.—p. 393.

Therapy of Genuine Lipid Nephrosis.—Lachnit points out that the most prominent symptom in lipid nephrosis is the tendency to edema and that restriction of the salt and fluid intake and the use of diuretics has found wide application in the treatment of the condition. He reports a case in which liver extract proved highly effective in combating edema. Liver extracts had been used by others in lipid nephrosis, but the mode of action is not clear. It is known that the liver plays an important part in the water exchange and that it probably contains some active substance. The author mentions the effect of vitamins of the B group on the water elimination. He does not regard liver therapy of lipid nephrosis as the only treatment. Symptomatic measures, particularly a restricted salt and fluid intake, high protein diet, diuretics, thyroid extracts and urea should be added to the liver therapy.

New Purified Serums.—Pöhacker-Fritsch and Siegl direct attention to two new purified serums derived from horses. In preparing one serum the protein bodies are subjected to fermentative decomposition. The serum proteins which do not have an antitoxic effect are split into low molecular substances and are removed from the serum. The sensitizing effect and the likelihood of anaphylactic reactions are greatly reduced in the use of this proteolytically purified antitoxin. Tests on actively or passively sensitized human subjects revealed that it requires five hundred times the dose of the purified antitoxin to produce the same reactions as the unchanged globulin. The protein fractions that are not vehicles of antitoxin were removed also from the other serum discussed here. The slight sensitizing effect of these new serums reduces the danger of serum disease in diphtheria as well as in tetanus, whereas the therapeutic efficacy is the same. The authors mention several investigators who proved their contention and describe their own investigations on children who at least two years previously had passed through diphtheria in the course of which serum had been given. These children were now given the entire therapeutic dose of the purified serums without the otherwise customary desensitization (Besredka). Only 1 of 5 developed a slight serum exanthem. The authors next tried new purified serums on 8 children who only twelve to twenty-one days previously had received ordinary diphtheria horse serum. None of these children showed anaphylactic symptoms. Tests were made on 43 children, 20 of whom received one type of purified serum and remained entirely free from reactions, whereas of the 23 receiving the other type 1 had a generalized exanthem and 2 localized serum exanthems. The authors conclude that the purified serums permit the therapeutic or prophylactic use of serum even for patients sensitized by previous treatment with horse serum.

Mitt. a. d. med. Akad. zu Kioto, Kyoto

32:1-450 (May) 1941. Partial Index

*Effect of Alpha-Naphthalene Potassium Acetate on the Growth of Mouse and Rat Tumors. S. Tuboi.—p. 176.

*Influence of Transfusion of Dried Blood on Agglutinin Formation. Y. Nakamura and K. Funakoshi.—p. 396.

*Influence of Blood Loss on Agglutinin Formation. Y. Nakamura.—p. 409.

Effect of Alpha-Naphthalene Potassium Acetate on Tumor Growth.—On the seventh day after transplantation of Bashford tumor in mice, Tuboi administered subcutaneously 0.5 cc. of a 1 per cent aqueous solution of alpha-naphthalene potassium acetate; and on the fifth day after transplantation of Sasaki-Yoshida rat tumor 1.5 cc. of the same solution was similarly injected, with the result that a satisfactory inhibition of tumor growth was demonstrated, as compared with untreated controls. The criterion of the inhibitory effect of the chemical on the growth of the transplanted tumors was the changes in the dimensions (length, width and thickness) of the mass as measured from day to day.

Transfusion of Dried Blood and Immunity.—Using a suspension of typhoid bacilli as agglutinogens, Nakamura and Funakoshi investigated in rabbits the effect of transfusion of dried blood suspended in saline solution on the production of agglutinins. They found no difference whatever in the ability of the animals to produce antibodies, whether fresh or dried blood was transfused. The suspension of dried blood was made up in 2 and 5 per cent concentrations, either of which was satisfactory in immunity production, as determined by the Widal technic.

Hemorrhage and Agglutinin Formation.—Nakamura found that the effect of blood loss on agglutinin formation appears to depend on the amount of hemorrhage. Small or moderate blood loss appears to accelerate antibody production, while a large hemorrhage temporarily suppresses the process but later accelerates it. Injection of physiologic solution of sodium chloride after copious blood loss shortens the period of suppression in antibody formation.

Okayama-Igakkai-Zasshi, Okayama

53:1-141 (June, Clinical Supplement) 1941. Partial Index

*Angioma Arteriale Racemosum. Y. Hiramatsu.—p. 1.

*Universal Scleroderma: Two Cases. U. Kinoshita.—p. 41.

*Parasitic Meningitis (Distomum Pulmonum) with Eosinophilia in Cerebrospinal Fluid. T. Nonomura.—p. 54.

*Pharyngeal Actinomycosis. M. Moriya.—p. 78.

Extrainsular Hyperglycemic Diabetes. R. Kira.—p. 100.

Results of Talma's Operation in Banti's Disease. S. Kayata.—p. 110.

Angioma Arteriale Racemosum.—Hiramatsu observed three instances of angioma arteriale racemosum in men aged 30, 38 and 40, the lesions occurring on either the temporal or the occipital area. When the tumor was well demarcated and relatively small, complete extirpation of the mass after ligation of the common carotid artery on the affected side was the only therapeutic procedure to result in a permanent cure. In one instance in which the tumor was ill defined and extensive, ligation of the common carotid artery produced no therapeutic effect and the mass could not be removed.

Universal Scleroderma.—Kinoshita reports his investigations on a girl aged 15 years and a woman aged 53 with universal scleroderma. No hereditary or previous history of any significance was noted, the disease manifesting itself in the younger patient at puberty and in the older one at the climacterium. The lesions first appeared in the extremities and gradually involved other areas. The only positive and significant pathologic changes were noted in connection with the functional disturbances of the coordination system belonging to the glands of internal secretion and of the vegetative nervous system. In both cases slight but persistent fever, a consistently increased basal metabolic rate and abnormal elevation of the specific dynamic action were noted. Other significant findings were positive dermographism, decreased perspiration in the affected skin and disturbance of water metabolism. The author is led to the conclusion that this disease is not a simple dermatosis but has its basis in the disturbance of the coordination system involving dysfunction of the endocrine glands.

Distomum Pulmonum Meningitis.—Nonomura observed a Korean man aged 30 who complained of headache, dizziness and vomiting. Physical examination revealed rigidity of the neck, left-sided facial paralysis, tinnitus and deafness of the left ear, nystagmus and choked disk, and from these symptoms a diagnosis of basal meningitis was made. Blood examination disclosed 31 per cent eosinophilia, and of the 297 cell count in the cerebrospinal fluid 98 per cent were eosinophils. No evidence of tuberculosis, syphilis or pyogenic infection producing encephalomyelitis was elicited. In the feces of the patient were found ova of *Ascaris*, *Ancylostoma duodenalis*, *Trichocephalus dispar* and *Trichostrongylus orientalis*; but, since these parasites are most unlikely to cause meningitis, other parasites were looked for. From elimination studies of other common parasitic diseases, the final diagnosis made was that of meningitis due to *Distomum pulmonum* infection. Treatment consisted of repeated lumbar punctures and administration of hypertonic dextrose solution and anthelmintic drugs. The patient was discharged from the hospital after one hundred and ten days symptom free.

Pharyngeal Actinomycosis.—Moriya reports a case of pharyngeal actinomycosis occurring in a 16 year old youth with complaint of presence of a foreign body in the throat for the preceding month. The lesion was painless, and no fever was experienced. The inflamed mass was incised, but no pus was obtained and the incision failed to heal. The author resorted to surgical removal of the palatine tonsils, and in the crypts of the glands as well as in the subepithelial tissues he demonstrated *Actinomyces hominis*.

Sei-I-Kai Medical Journal, Tokyo

60:332-581 (April) 1941. Partial Index

*Microscopic Study of the Glycogen Content of Human Tonsils. T. Ogino.—p. 446.

*On the Toxicity of Urine. S. Yasuda and T. Sakabe.—p. 565.

Glycogen in Human Tonsils.—Ogino reports the results of microscopic studies on the distribution of glycogen in 67 specimens of surgically removed human tonsils, of which 26 were from children and 41 from young adults. Eight cases of acute tonsillitis are added. The tissues were fixed either in Carnoy's fluid or in absolute alcohol, sections 10 microns thick having been made from celloidin embedded blocks and stained with Best's carmine technic. The study revealed an abundant glycogen storage in the stratified squamous epithelium of the tonsils, the surface epithelium containing more glycogen than that of the tonsillar crypts. But little glycogen was present in the lymphoid tissue of the tonsils, and the same was true of the interfollicular reticular tissue. The wandering cells scattered throughout the entire tonsil contained significant amounts of glycogen, though never as abundantly as did the epithelial cells. In the epithelium, glycogen occurs mostly within the large "prickle cells" in the stratum spinosum, while the proliferating portion of the basal layer shows but a scant amount of animal starch. Glycogen is present in but small amounts, or entirely absent, in a certain number of polymorphonuclear leukocytes, plasma cells, lymphocytes, lymphoblasts, histiocytes, reticulum cells and fibroblasts. In acute tonsillitis a large number of migrating polymorphonuclear leukocytes reveal the presence of glycogen in relatively large amounts, as compared with those in cases of chronic inflammatory or hypertrophied tonsils. The author regards the fluctuations in the glycogen content of each cellular constituent of the tonsils to be of a greater diagnostic significance than the variations in the organs as a whole.

Toxicity of Urine.—Yasuda and Sakabe endeavored to ascertain the toxicity of human urine by determining the minimal lethal dose of intraperitoneally injected urine in healthy mice. It was found that, though there may be considerable variation from sample to sample, the average minimal lethal dose of normal human urine was 0.5 cc. per gram of body weight. The toxic effect of rabbit urine on mice was approximately twice as great as that of human urine, and the toxicity increased in experimental animals either in a state of starvation or on a high protein diet. Although the toxicity of urine

varies but little with reference to the age of the patients from whom the samples are obtained, the urine of infants under 1 year of age seems to be less toxic than those from older individuals. The degree of toxicity, however, seemingly bears no relation either to the hydrogen ion concentration or to the protein content. The only suggestive correlation noted was that of the specific gravity, the higher the gravity the greater being its toxic effect. Neither decomposition nor boiling of the urine altered its toxic nature; likewise no diminution in toxicity was observed when the urine was diluted. Filtration through filter paper exerted no significant change in the toxicity of the urine, but passage through a bacterial filter did render the urine less toxic. The only necropsy finding in animals poisoned with large doses of urine was the presence of a nonbacterial inflammation with a tendency to hemorrhage.

Tokyo Igakkwai Zassi, Tokyo

55:479-527 (June) 1941. Partial Index

*Effect of Digitalis Leaves on the Heart Shadows in Cardiac Decompensation. H. Hata.—p. 479.

*Studies on Lobar Pneumonia: II. On the Blood Picture in Lobar Pneumonia. F. Kodama, T. Hirayama and H. Sekizawa.—p. 498.

Digitalis in Cardiac Decompensation.—Hata selected 35 cases of primary cardiac decompensation with no complications other than hypertension and secondary renal disorder. Preliminary to the study of changes in the heart shadows due to digitalis medication, the author tested the effect of bed rest in these patients. He was reassured of the beneficial effect of rest, as evidenced by diminution in the heart size up to 10 per cent, although in a few instances either no effect was observed at all or else the disease definitely progressed. During the observation period, in which digitalis treatment was instituted, frequent roentgenograms were made and the actual area of the heart shadow was measured by means of a planimeter. The author found that the clinical symptoms of the patients greatly improved when the diminution in cardiac shadow exceeded at least 10 per cent of the original size; and even in cases in which the diminution in the heart shadow was less than 10 per cent the progressive shrinkage was invariably paralleled by some degree of clinical improvement. If, on the other hand, the heart size increased in spite of the treatment, the prognosis was always poor. Furthermore, if 1 Gm. of digitalis leaves produced even as little as 15 sq. cm. of shrinkage in the heart shadow, there was still an improvement in clinical symptoms; but an increase of 5 sq. cm. or more was usually associated with exacerbation of symptoms. Thus the author concludes that a direct parallelism exists between the changes in clinical symptoms and the size of the heart shadows in the patients with cardiac decompensation.

Blood Picture in Lobar Pneumonia.—Kodama and his associates present results of blood studies in 114 cases of lobar pneumonia with 61 recoveries and 53 deaths. In practically all cases leukocytosis was the predominant feature, present immediately after the onset and continuing throughout the course of the disease. In cases with favorable prognosis the leukocytosis reached its maximum just before the resolution by either crisis or lysis. While no rule could be established as to the leukocyte level, the general average count was much higher in cases of resolution by crisis than in those by lysis. Leukopenia was almost always a sign of poor prognosis, and in one of the fatal cases a leukopenia so extreme as to be indistinguishable from the typical picture of granulocytopenia occurred. There was a close relationship between leukopenia and bacteremia, the majority of cases with leukopenia developing bacteremia. Leukocytosis of lobar pneumonia is due to the absolute increase of neutrophilic granulocytes, and death frequently resulted in patients with neutrophilia of 70 per cent or less, while those with 90 per cent or over had better recuperative power. Eosinophilic granulocytes were frequently increased, the maximum being 7.5 per cent, while the basophils showed no abnormal increase. Immature granulocytes, particularly myelocytes, were found in a relatively large percentage of cases; 74 per cent of the patients had myelocytes in the peripheral blood, and of these patients only 33 per cent recovered.

Maandschrift voor Kindergeneeskunde, Leyden

10:311-348 (May) 1941

Cavities Communicating with the Bladder (Diverticula, Cavities of Bipartite Bladder and Ureterocele). H. J. Boevé.—p. 311.

*Potassium Chlorate in Therapy of Poliomyelitis. H. J. Kolk.—p. 323.
Rare Case of Gangrene of Hymen as Complication of Measles. A. C. Rosman.—p. 332.

Congestion Hemorrhage in the Newborn. J. D. Lebreton.—p. 335.

*Vitamin P. J. Groen.—p. 339.

Potassium Chlorate in Poliomyelitis.—Kolk emphasizes that, to estimate the value of Contat's potassium chlorate treatment of poliomyelitis, it is necessary to consider the character of the epidemic and the fact that there are numerous cases of poliomyelitis which pursue a mild course and in which paresis disappears within a few days. He reports his experiences in a 1939 epidemic of poliomyelitis. The cases which test and demonstrate the efficacy of potassium chlorate are those in which early paralysis exists. The author observed that in cases in which meningeal symptoms are present there is a likelihood of the appearance of paralytic symptoms. He decided that these cases would be a test for potassium chlorate therapy. He found that no paralysis developed in 29 cases of meningeal symptoms in which potassium chlorate was given. Of the patients observed during the first part of the epidemic, when potassium chlorate was not used, 22 had meningeal symptoms. Two of these incurred paralysis.

Vitamin P.—Groen points out that soon after the isolation of pure l-ascorbic acid it was discovered that, whereas this substance is ineffective in pathologic conditions characterized by increased permeability of the capillaries, these disorders can be combated by extracts of peppers or lemons. This suggested that lemon juice contains in addition to vitamin C another substance which is probably a flavone or a flavone glucoside. Szent Györgyi designated this substance vitamin P because it influences capillary permeability. Subsequent investigations revealed that hesperidin and the glucoside of eriodictyol are the active substances. They occur chiefly in lemon peel. The mixture of hesperidin and eriodictyol glucoside which is extracted from lemons is referred to also as citrin. The demonstration of flavones encounters considerable difficulties because some of the reactions used for this purpose are not specific. Animal experiments with vitamin P likewise encounter difficulties because there is no criterion for flavone-free feeding. The type of animal best suited for this test has not been discovered, and it has not been determined which flavones are active. The author asserts that some investigators used substances that were not identical with Szent Györgyi's citrin, and he advises repeating the animal tests with properly identified material. Citrin acts satisfactorily in hemorrhagic diseases in which the capillary resistance is impaired, but it has a noteworthy effect also in other pathologic conditions of the blood. Efforts should be made to find a more exact method for the detection of vitamin P in order to determine its absence from the diet.

Acta Medica Scandinavica, Stockholm

108:151-362 (July 30) 1941. Partial Index

Studies on Cardiac Output and Related Circulatory Functions, Especially in Patients with Congestive Heart Failure. T. Espersen.—p. 153.

Resorption Disturbances of Carbohydrates, Fats and Vitamins in Hypophysectomy. C. L. C. van Nieuwenhuizen.—p. 195.

Clinical Method for Determination of Velocity of Current in Venous System. C. Grill.—p. 212.

*Value of Fluorescence Microscopy for Demonstration of Tubercle Bacilli in Sputum. P. N. Oscarsson.—p. 240.

Special Form of Leukemia. J. J. de Jong.—p. 251.

*Scotopic Vision and Liver Function Under Thyrotoxicosis. E. Godtfredsen.—p. 261.

Familial, Congenital Sinus Tachycardia. P. Wising.—p. 299.

*Development of Cirrhosis of Liver After Acute Hepatitis, Elucidated by Aspiration Biopsy. N. B. Krarup and K. Roholm.—p. 306.

Fluorescence Microscopy for Demonstration of Tubercle Bacilli in Sputum.—Introduction of fluorescence microscopy by Hagemann in 1937 (abstr. THE JOURNAL, June 5, 1937, p. 2006) and the adaptation of this method for the demonstration of tubercle bacilli (abstr. THE JOURNAL, Sept. 23, 1939, p. 1265) seemed to open up new possibilities for a rapid diagnosis of tuberculosis. Oscarsson practiced fluorescence microscopy on 650 sputum specimens and compared the results with those obtained with the Ziehl-Neelsen method. He stained two smears from each specimen according to the Ziehl-Neelsen

method and prepared a third smear for fluorescence microscopy. Of the two Ziehl-Neelsen smears one was the "blue preparation" (counterstained in the usual way with borax methylene blue) and the other the "yellow preparation" (counterstained with 0.1 per cent solution of picric acid). A comparison of the yellow and blue preparation on the one hand, and of the fluorescence preparation on the other, disclosed that 142 sputum specimens gave positive results in 1, 2 or all 3 preparations. The fluorescence preparation was positive in 131, it failed in 11 cases in which the two other preparations (singly or together) had been positive. Of the 131 specimens that proved positive under fluorescence microscopy, 100 proved positive in the yellow and/or blue (77 in the yellow and 68 in the blue) preparation. Oscarsson sees the chief advantage of fluorescence microscopy in the rapidity with which positive results can be obtained. In this respect fluorescence microscopy is far superior to the earlier methods. It demonstrates tubercle bacilli in some cases in which the other staining methods give negative results, but on the other hand there is a possibility of "excess diagnosis." Fluorescence microscopy is somewhat inferior to the animal test and culture method.

Dark Adaptation and Liver Function in Thyrotoxicosis.—Godtfredsen directs attention to the relation between vitamin A and the thyroid hormone, to the relation of the hepatic function to both thyroxine and vitamin A and to the importance of vitamin A in the physiology of vision. He studied hepatic function, cholesterol content of the serum and dark adaptation in 10 patients with goiter. The functional tests of the liver disclosed no serious defects. The serum cholesterol values were either normal or slightly below normal. The dark adaptation was slightly impaired, corresponding to the mild changes in the vitamin A content. There was a parallelism in the pathologic aspects detected by the three methods, and in this respect the present investigations are in line with the observations of other authors. That the dark adaptation disclosed an impaired vitamin A regulation in spite of a high vitamin diet must be ascribed to the thyrotoxic hepatic lesion. The exact mechanism of the lowering of the vitamin A level has not been explained, but it is understandable in view of the importance of thyroxine in vitamin A storage. There is actually a downward regulation and not a simple A avitaminosis, because even the parenteral administration of vitamin A is without effect until the thyrotoxicosis has been eliminated. In the author's cases dark adaptation did not improve until the surgical or roentgenologic treatment of the goiter had taken place.

Aspiration Biopsy in Cirrhosis of Liver.—Krarup and Roholm point out that although acute hepatitis presents a characteristic clinical picture its nomenclature has been indefinite. Until recently it was commonly referred to as catarrhal jaundice, but lately the designation acute or epidemic hepatitis has become more general. The course of the disease may be acutely malignant or protracted. In the latter form the onset is insidious and the course protracted. Cases of this condition may present considerable differential diagnostic difficulties, owing chiefly to insufficient knowledge of the pathologic anatomy of hepatitis. The prevailing view of the disease as a serous-parenchymatous inflammation of the liver is based on studies by Eppinger in 1918 and on biopsy studies on patients with hepatitis who had been operated on after a diagnosis of obstructive jaundice. Recently the knowledge of the histology of the disease has been extended by the aspiration biopsy of Iversen and Roholm (*Acta med. Scandinav.* 102:1 [Sept. 23] 1939; abstr. THE JOURNAL, Dec. 9, 1939, p. 2194). These authors report observations on 12 patients with severe, protracted, relapsing hepatitis. Aspiration according to the method of Iversen and Roholm was done once or several times in each case and the microscopic aspects of the biopsy material are described. All sorts of transitions were observed between acute hepatitis and fully developed cirrhosis. This gives a picture of the morphologic pathogenesis of cirrhosis of the liver. Beginning cirrhosis may be demonstrable a few weeks after the manifestation of hepatitis, but the development may also be insidious and extend over several years. Some of the patients described here later exhibited clinical signs of cirrhosis. None of the patients had a history of excessive consumption of alcohol. These observations furnish a pathologic-anatomic basis for the nosologic unity of acute hepatitis and cirrhosis of the liver.

Book Notices

Infantile Paralysis: A Symposium Delivered at Vanderbilt University, April 1941. Cloth. Price, \$1.25. Pp. 239, with illustrations. New York: National Foundation for Infantile Paralysis, Inc., 1941.

This small book comprises six lectures by different authors given at Vanderbilt University under the auspices of the National Foundation for Infantile Paralysis. The lecture on treatment, the last one in the book, will be most helpful to all physicians responsible for the care of victims of infantile paralysis. Dr. Frank R. Ober says that no 2 cases are exactly alike in their disabilities. The best prognosis depends so much on early prevention of deformity that it is incumbent on the family doctor to do everything possible to prevent deformities. He may obtain simple splints on short notice from the National Foundation for Infantile Paralysis. The help of an orthopedic surgeon is needed also even in the early stages.

Dr. John R. Paul reviews the epidemiology of poliomyelitis, emphasizing the clinical side. Only recently have we become aware of the neglect of the clinical epidemiology of poliomyelitis and realized that many of our interpretations and theories have been drawn more from observations on monkeys than on men, more from figures than on clinical facts. Investigators have become concerned with the fallacies of the neutralization tests as an epidemiologic tool in this disease, for this test has not elucidated the problem as to how the majority of children acquire immunity to poliomyelitis. It seems likely that the abortive cases represent the crux of many problems in the epidemiology. The idea so frequently held that poliomyelitis seldom attacks more than one member of a family is erroneous; what is meant is that the disease seldom paralyzes more than one member of the family. Patients under 5 years of age are more apt to harbor the virus in their intestinal tracts than are older persons. Dr. Paul summarizes the knowledge of the various ports of entry of the disease in man with the statement that it seems unlikely that the olfactory bulbs represent the usual port of entry; the oral cavity and the gastrointestinal tract seem more likely, while the cutaneous route is a possibility.

Dr. Ernest W. Goodpasture's review of the pathology and pathogenesis of poliomyelitis is an interesting chapter. He credits John Rissler of Stockholm with the first classic account in 1888 of the acute morphologic manifestations of the disease. The experimental infection of monkeys first accomplished by Landsteiner and Popper afforded for the first time a method for determining the distribution of the infectious agent in the tissues of man in relation to demonstrable lesions. Nerve cells are not all equally susceptible to the virus, the great motor cells of the cord in the lumbar and cervical enlargements being most, and the cells of the cerebral cortex seeming comparatively slightly, susceptible. The study of the pathology of experimental poliomyelitis in monkeys has equipped us with many new facts and novel points of view. It has demonstrated the general character of the etiologic agent and confirmed the impression that the disease is primarily an infection of the nervous system, that the nerve cells themselves are the primary sites of injury, that the infectious agent is located within the neurons, spreading mainly by means of infected processes of nerve cells rather than through the body humors; but in spite of all this knowledge the important practical problem of a port of entry for the virus in man remains unsolved. It is known that the elimination of the virus can be through the mouth and nose and more abundantly from the intestinal tract. This does not necessarily mean that the port of entry is in either tissue, for it might represent only the elimination of the virus by means of a centrifugal spread from infected nervous tissue.

Poliomyelitis is by no means limited to young people. In the chapter on immunologic and serologic phenomena Dr. Thomas M. Rivers points out that the number of adults attacked in certain epidemics may be as high as 15 to 30 per cent. All races of human beings, as well as monkeys, are susceptible, and within the last year or two at least one strain of poliomyelitis virus has been adapted to cotton rats and white mice. As far as is known, horses, sheep, calves, dogs, rabbits, guinea pigs and chickens are refractory to infection. There are at least

twenty to twenty-five good examples of second attacks of the disease in human beings on record, although usually one frank attack apparently produces lifelong immunity. The neutralizing antibodies which are found in abundance in the blood of normal and convalescent persons do not appear in the spinal fluid. There is some barrier between the brain and the blood which prevents the passage of immune substances. The role played by the neutralizing antibodies in recovery from infection is not known. Poliomyelitis may occur in human patients who have ample amounts of neutralizing antibodies in their blood. There is no way at present of bringing into harmony all the disconcerting facts about the serologic and immunologic phenomena of poliomyelitis.

The etiology is discussed by Dr. Charles Armstrong. This, like the chapter just reviewed, is largely a critical review of literature. The poliomyelitis virus is an agent whose identity is largely determined by the symptoms and pathologic changes which it produces and by its immunologic and epidemiologic characteristics. The virus has been demonstrated in different parts of the central nervous system as well as in the tonsils, adenoids, mesenteric glands, salivary glands, inguinal glands, in a pool of lungs, liver, spleen and kidney, and in the washed walls of the ileum and colon. There are numerous strains of poliomyelitis virus, but no general immunologic classification of them has been made. In spite of repeated trials, no specific diagnostic test has been evolved. The only conclusive diagnostic evidence to be had is the recovery of the virus from the central nervous system of the patient; but, since virus cannot be demonstrated in the spinal fluid, this test is applicable only in fatal cases. This lack of an effective etiologic diagnostic procedure, together with the variable clinical manifestations of the disease, has led to skepticism, often voiced by workers in this field, relative to the diagnosis of poliomyelitis in the individual case.

Poliomyelitis undoubtedly has existed for many centuries, but it has only gradually and comparatively recently been separated from a similar group of palsies. It also took centuries to distinguish typhoid from typhus and measles from scarlet fever. Dr. Paul F. Clark in the opening chapter on the history of poliomyelitis says that the first recorded epidemic of infantile paralysis was reported by Badham in Workshop, England, in 1835. That report aroused the interest of Jacob Heine in Germany, who about 1840 gave the first clear description of the acute disease. In 1890 Medin in Sweden distinguished the bulbar, ataxic, encephalitic and polyneuritic types in addition to the spinal form. Caverly in Vermont in 1894 recognized the abortive type of case, and Wickman a few years later showed the importance of abortive cases in the spread of the disease. Epidemics of poliomyelitis show a practically worldwide distribution. Although there is a heavy incidence in northern Europe and the northern part of the United States and Canada, and regions in the Southern Hemisphere, no special climatic conditions are essential for its spread. Winter epidemics have occurred even beyond the arctic circle. Children under 5 years of age furnish 50 to 90 per cent of the cases, although they constitute only from 9 to 12 per cent of the population, and thus the disease came to be known as infantile paralysis. More males than females in all age groups are affected. In the United States throughout the present century an average of about 4,500 cases have been reported annually with epidemic peaks in certain years, the greatest in 1916, making a total of 176,369 cases through 1938. Poliomyelitis is responsible for more cripples than all other acute diseases combined. Permanent crippling results in from 30 to 60 per cent of the cases reported. The economic loss, the mental suffering through life and the burden on the families cannot be estimated. The report by Landsteiner and Popper thirty-three years ago on the first successful transfer of poliomyelitis to the Rhesus monkey has been one of the most important developments among the countless investigations of this disease. This milestone in research is referred to in all the lectures but one in this book and gives the impression, along with similar repetitions, of some unnecessary duplication. Perhaps another milestone was reached last year with the report by Jungeblut and Sanders of the adaptation of the New Haven SK strain of virus to the cotton rat and thence to the mouse on three different occasions, with gradual loss of virulence for the monkey but with persistence of slight invasive properties.

The chapters on etiology, immunology, pathology and epidemiology suggest the vastness of the research that remains to be done. Dr. Clark feels confident that, with the recognition that there may be as many strains of poliomyelitis virus as types of pneumococci, with the knowledge that the disease differs in different species of susceptible animals, with the use of new methods to demonstrate the virus in sewage and with the passage of several strains of virus to the cotton rat and mouse, we have tools and hypotheses which will be the basis of further rapid advance.

Social Case Records from Psychiatric Clinics with Discussion Notes. By Charlotte Towle. The University of Chicago Social Service Series. Edited by The Faculty of the School of Social Service Administration. Cloth. Price, \$3. Pp. 453. Chicago: University of Chicago Press, 1941.

Primarily for students of psychiatric social work, this book is made up of an introduction and chapters comprising a discussion of 12 extensive cases which were studied and treated by the psychiatric social worker. Two are studies of young women who had adjustment problems; the others cover various types of problems found in children from the very young to the adolescent. Most of the work in these cases has been done by the social worker herself, apparently with the cooperation of a psychologist and psychiatrist. Each case is made up of an extensive social history which covers all phases and has been elicited from a relative or other informant. Little diagnostic material is incorporated in the history, although each case is compiled in a rather dramatic way to demonstrate the historical material as the social worker elicits it and leaves the trained and observant reader with a definite conclusion. In addition to this historical material there is a chronological account of the worker's progress in treatment, expressed usually in terms of interviews with relatives. Few actual interviews with the patient are incorporated in the book, and the reviewer was able to find only one which was extensive enough to give direct insight into the child's condition. The statements made by the psychiatrist, his methods of investigation and what he has discovered about the cases are given largely by indirection. Since the book is intended primarily for students of psychiatric social service, interpretative material is left out except as it is suggested in the summary at the end of each case. This summary raises certain questions for class discussion. Again the trained reader grasps ideas about the case by indirection from the points that the author brings up for class discussion. This book is not a textbook in the sense that it is all inclusive and gives every type of social history possible; in fact, organic cases are stressed to a greater extent than one is likely to find them in the usual child guidance clinic. No one can criticize the thorough, careful, systematic, intelligent and highly professional approach which has been made to each case. The volume makes interesting reading, and, while the social worker's approach is overstressed and the psychiatrist's direct work on the patient is minimized, the book should be of considerable interest to the psychiatrist who is interested in work with children and to the pediatrician who wishes to acquaint himself with another approach to the care and treatment of the problem child.

Mental Hygiene in Education. By Ernest W. Tiegs, Ph.D., Dean of University College and Professor of Education, The University of Southern California, Los Angeles, and Barney Katz, Ph.D. Cloth. Price, \$2.75. Pp. 418. New York: Ronald Press Company, 1941.

This contribution to the field of mental hygiene is made primarily by psychologists who are interested in educational and clinical psychology. Their bias, therefore, lies against psychiatric training in the study of problem cases. There is little mention of psychiatric social work and none of the coordinated clinical approach which has proved its value and in which psychologist, social worker, physician and psychiatrist have formed a team to analyze and treat problem children. On the other hand, although it should be expected, there is little discussion of school mental hygiene administration, which is the usual approach in giving teachers insight into the proper handling of the problem children who go through their hands. The book is composed of three parts. The first deals with the general problem of mental health, citing statistics and going into considerable detail about abnormal conduct and adjustment and theories of personality. The point of view in the second part is more clinical. There is a chapter which is somewhat

misleading and a little confusing on modern psychologic theories of personality, and some discussion on the improvement of personal and social adjustment. The authors present in a rather dogmatic and incomplete fashion, which may be necessary in an elementary book, the place of school, the family and the community in the correction of personality problems. The third part is a condensed textbook on abnormal psychology and deals with sexual difficulties, daydreaming, psychoneuroses, the psychoses and similar topics. In this last part the authors show little practical experience and almost no insight into the problems of seriously maladjusted persons. There is a serious question whether this book would be of much value to the psychiatrist, for it neither gives completely the teacher's point of view nor discusses in any great detail matters which have to do with bringing up children. There is too much general clinical psychology and too much of the psychologic approach to problems which are better dealt with by psychiatrists. The most serious criticism of this work is that the authors lead prospective patients with severe psychiatric problems into the hands of clinical psychologists rather than psychiatrists, for even when they recognize that a psychiatric problem exists they suggest that the patient could also be referred to a clinical psychologist after the psychiatrist has initiated treatment.

Cytology, Genetics, and Evolution. By M. Demerec et al. University of Pennsylvania Bicentennial Conference. Cloth. Price, \$2. Pp. 168, with illustrations. Philadelphia: University of Pennsylvania Press, 1941.

This book, published without preface, introduction or editor's note, consists of twelve short papers by as many different authors. These papers were read as part of the University of Pennsylvania bicentennial conference. The contents of the book are best indicated by listing the titles of the papers and their authors:

Chromosomes and Heredity: The Nature of the Gene. M. Demerec.
Chromosome Structure. Charles W. Metz.
Cytogenetics and Evolution. Albert F. Blakeslee.
Chromosomal Differences Between Races and Species in *Drosophila*. T. Dobzhansky.
Evolution of the Germplasm. Clarence E. McClung.
Cytology and Genetics of Protozoa: Heredity Status of the Rhizopods. Herbert S. Jennings.
Nuclear Behavior and Reproduction in Ciliated Protozoa. William F. Diller.
Inheritance in Ciliated Protozoa. T. M. Sonneborn.
Physiology of the Nucleus: The Physicochemical Properties of the Nucleus. Leon Churney.
The Chromosomes of the Amphibian Nucleus. William R. Duryea.
Radiation and Cell Nucleus. Paul S. Henshaw.

As the reader will see from the titles, the conference concerned itself with frontiers of research and speculation in the highly technical field of cytogenetics. The book is a difficult one for any but the advanced student of genetics. It records many recent advances in a field that holds great promise for the solution of the problems of the complex mechanisms of organic evolution.

Faith is the Answer: A Psychiatrist and a Pastor Discuss Your Problems. By Smiley Blanton, M.D., and Norman Vincent Peale, D.D. Cloth. Price, \$2. Pp. 223. New York & Nashville: Abingdon-Cokesbury Press, 1940.

This is an unusual book in the way in which it is constructed. It is a joint product of the thoughts of a psychiatrist and of a minister. There have been books written previously with this type of synthesis, but usually the ideas were pooled. In the present volume this is not the case. Of each chapter Dr. Blanton, the psychiatrist, writes the first half, and Dr. Peale deals with the same subject in the second half. The book makes no attempt to be comprehensive but deals with certain phases of mental problems which come up from time to time in the experience of the minister, particularly those connected with fear, worry, a sense of guilt and a sense of self criticism due particularly to failure and then, of course, the big problem of the minister, that of assuaging the grief and sorrow of those who suffer. The problems of marriage, which is becoming more and more a point of contact between the ministry and psychiatry, are covered in one chapter. The book is not profound in its treatment of these subjects and offers nothing especially new except perhaps a synthesis of the pastor's standpoint with the medical one, which synthesis is largely philosophical and deals with faith and religious beliefs which are not highly indoctrinated and which are relatively consistent with

all sects. These authors briefly present a number of interesting cases showing how problems arise and how in many cases they can be dealt with successfully, and these make interesting reading. The book by itself probably cannot be used therapeutically. Its profundity is not great enough to serve as a textbook for a psychiatrist who wishes to know more about the use of religion in dealing with mental problems. However, it does treat of an interesting subject with which many psychiatrists and ministers could make themselves better acquainted.

Modern Marriage: A Handbook for Men. By Paul Popenoe, General Director, the American Institute of Family Relations, Los Angeles, Calif. Second edition. Cloth. Price, \$2.50. Pp. 299. New York: Macmillan Company, 1940.

This is a second edition of a rather sound little volume written by a biologist who has interested himself for many years in family relations. The book is written primarily for men and apparently for those who are only contemplating marriage; its major point of view is not in postmarital adjustment but to give advice which can be presented to those who are not yet married, by which they may know the possible pitfalls and, on the other hand, how best to comport themselves during the preproposal, engagement and early marital periods. Although the volume is not ponderous in the sense of presenting a great deal of scientific information in the form of tables, appropriate statistics are readily at the author's hand to illustrate points which he brings up. This book is different from the old fashioned sex guides for young men in that it does not hedge in discussing sex; there is a discussion of sexual adjustment: what is to be expected in marriage from a sexual angle both psychologically and physiologically. The social factors of domestic adjustment are carefully stressed, especially those which arise from such sources of friction as different religions on the part of the man and the woman. The nature of the proposal, the details of the marriage ceremony and the life shortly after marriage are taken up in some detail. This book is one the physician can give to a young man considering marriage or to one who wishes to know what is going to confront him in later years when marriage will be a problem to him. There is an excellent bibliography and six appendixes giving statistical material. The seventh appendix consists of a rather dramatic account of a woman who has passed through childbirth which seems somewhat out of place in the book. Nevertheless this little volume deserves a recognized place in the growing literature on marital adjustment and on the scientific guidance of persons who contemplate marriage. Its style is interesting and simple.

Psychiatric Social Work. By Lols Meredith French, Director, Study of Trends, American Association of Psychiatric Social Workers, New York. Cloth. Price, \$2.25. Pp. 344. New York: Commonwealth Fund; London: Oxford University Press, 1940.

This volume is primarily an outline of professional psychiatric social work to show the various aspects of that field and to consider the various problems and interests which affect the psychiatric social worker. The history and development of the field are dealt with rather extensively, as are the more strictly professional problems such as the pay of the social worker, his professional relationships, the type of work he would do in various types of hospitals and clinics, and the development of treatment procedures to be carried out by this professional group. This last aspect forms the most interesting chapter in the book because there is a discussion, too brief in many instances, of treatment procedures which are in use in adjusting life problems of adult and child. There is a consideration in several places of the equipment in terms of training and experience that a psychiatric social worker should have, and the two appendixes deal with (1) the American Association of Psychiatric Social Workers and (2) the salaries of psychiatric social workers. Appended to the volume is a splendid bibliography covering every aspect of the field. This book will, of course, be a "must" for those thinking of going into the field of psychiatric social work, and for the psychiatrist or even the physician who has dealings with professional workers of this sort the book may serve as a means of clarifying any misunderstanding in his mind as to what the properly trained worker in this field stands for and is able to do.

Mental Disease and Social Welfare. By Horatio M. Pollock, Director of Mental Hygiene Statistics, New York State Department of Mental Health. Cloth. Price, \$2. Pp. 237. Utica: State Hospital Press, 1941.

This is a volume of collected studies made by the author during the past twenty years. There are sixteen studies, all of which, with the exception of one dealing with mental disease in Peru, are statistical in nature. They are composed of long tables, careful discussions and competent interpretations of a number of facts which those interested in mental disease should be acquainted with. There are studies of mental disease with relation to suicide and crime, with expectation of becoming mentally ill, economic loss due to mental disease, trends in dementia paralytica, various factors in heredity and environment in causing manic depressive psychosis and dementia praecox. Two papers consider alcohol; one deals with its relation to alcoholic mental disease before, during and after prohibition and the second one concerns thirty years of alcoholic mental disease in New York State. Space does not permit a detailed discussion of the conclusions drawn in each of these studies. Suffice it to say that the volume is a distinct contribution to psychiatry, that every psychiatrist should be aware of its contents. In some cases, conclusions which Pollock draws are not of great importance; in others they are very revealing, particularly in the comparative study of hereditary and environmental factors in mental disease, where he finds heredity to be much more important than most people have been considering it contemporaneously. The figures with which Dr. Pollock deals are large and adequate in number for proper statistic analysis. The completeness of his studies and his conservativeness in drawing conclusions are impressive.

Lectures on Conditioned Reflexes. Volume II: Conditioned Reflexes and Psychiatry. By Ivan Petrovitch Pavlov. Translated and edited by W. Horsley Gantt, M.D., B.Sc., Associate in Psychiatry and Director Pavlovian Laboratory, Johns Hopkins University, Baltimore. Cloth. Price, \$4. Pp. 199, with 7 illustrations. New York: International Publishers, 1941.

This is the second volume of collected lectures on conditioned reflexology which have been translated and edited by Gantt, a co-worker of Pavlov for about five years. The earlier volume dealt with more specifically physiologic matters. The present work consists of an excellent introduction by the editor-translator discussing Pavlov's later life, attitude and scientific problems and describing in considerable detail how, after reaching 75 years of age, Pavlov took a new lease on life and went into the field of psychiatry to investigate it with respect to the bearing on it of his own work on conditioned reflexes. Sixteen lectures are included in the present volume, which deals with Pavlov's interpretation of higher nervous activity, the fusion of the objective and subjective, experimental neuroses, the hypnotic state and animal and human neuroses, and there is an attempt at physiologic interpretation of obsessions and of paranoia and hysteria, as well as a discussion of nervous activity with particular reference to the interdependence with neuroses and psychoses. One chapter comprises a long presentation in which Pavlov makes some criticisms of the work of American psychologists, who he believes intend to throw off the physiologic interpretations which Pavlov feels to be valid. This is an excellent work from the standpoint of educating psychologists as well as psychiatrists and other interested physicians concerning Pavlov's reflexiologic attitude toward mental disorders.

Manual of the Diseases of the Eye for Students and General Practitioners. By Charles H. May, M.D., Consulting Ophthalmologist to Bellevue, Mount Sinai and French Hospitals, New York. Seventeenth edition, revised, with the assistance of Charles A. Perera, M.D., Associate in Ophthalmology, College of Physicians and Surgeons, Medical Department of Columbia University, New York. Cloth. Price, \$4. Pp. 519, with 387 illustrations. Baltimore: William Wood & Company, 1941.

Seventeen editions of this book have been published, also translations in the Spanish, French, Italian, Dutch, German, Japanese, Chinese and Hindu languages. In the present volume two new color plates have been added as well as black and white illustrations; an appendix supplies the ocular requirements for admission to the Army, Navy and Air Service of the United States.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PROPHYLAXIS OF RINGWORM IN ARMY CAMPS

To the Editor:—We are having an epidemic of ringworm, usually occurring about the groin. We would appreciate any suggestions on how to prevent its spread.

Thomas A. Messina, 1st Lieut., Med. Corps.
353d Field Artillery, Camp Livingston, La.

ANSWER.—There are two common methods of infection of glabrous skin with the ringworm fungi:

1. Infection may be incurred from the floors of bathrooms and perhaps other surfaces on which the patient walks with bare feet. This is thought to be made much more likely if the floor is wet, as in swimming pools, gymnasiums and clubs. Infection takes place between the toes because of the moisture present and its inaccessibility to careless attempts at cleaning. From this location the organisms may be carried to any part of the body or may locate under the toe or finger nails and be spread from these foci.

2. The infection may be spread directly from one person to another by exchange of clothing or bath appurtenances.

Less common is the spread from the infected scalp of children to other parts of the body. Fear of direct infection from the water of swimming pools is not well founded, for while impetigo presumably from this source is often seen ringworm does not seem to occur in this manner.

In a camp with many becoming infected about the same time, the second mode of infection listed is more apt to be the actual one, though the first cannot be excluded.

Prophylaxis of the first source consists of thorough cleansing of bathroom floors and instruction to the bathers to wash the feet thoroughly, giving special attention to the spaces between the toes, and to wipe the feet while still in the tub or shower room, putting on bath shoes before starting out. The same care should be used in wiping between the toes as is used in washing these spaces. Fraser (*The Treatment and Prophylaxis of Superficial Ringworm Infections, J. Roy. Army M. Corps 74:145* [March] 1940) said that to wash the feet and then step out on the bathroom floor before wiping them is as sensible as it would be to wash the hands and then rub them on the floor before wiping them. He mentioned also the need of some artificial method of drying towels in a moist climate, after they have been thoroughly sterilized in the process of washing.

An acid wash such as weak acetic acid may be used between the toes as a prophylactic. A dusting powder containing a small percentage of salicylic acid may be used for the same purpose.

Prophylaxis of the second source of infection is attained by strict prohibition of interchange of clothing or towels and the thorough sterilization of these articles when washed. If towels are to be used more than once between washings, Fraser's admonition about drying them should not be forgotten.

Goldman (*The Principles of the Control of Fungus Disease of the Feet in the Military Organization, Mil. Surgeon 84:35* [Jan.] 1939) stressed the value of a fungus record for each soldier, begun on his entrance into the army and continued throughout his service. He advocated careful inspection at regular intervals, special attention being given to the spaces between the toes. Scaling of this region which does not clear up on soothing treatment is probably due to dermatomycosis. In lectures to the men on hygiene mention should not be omitted of the principles of protection from ringworm.

Treatment of ringworm should be mild enough not to cause irritation of the skin, for sensitization to various contact materials occurs readily in those afflicted with the disease. The physician must always be on the watch to distinguish the beginning of such allergic dermatosis from a spread of the dermatomycosis.

STICK REMOVAL EVACUATION OF UTERUS

To the Editor:—In incomplete abortion, what is meant by sponge stick removal of the product of conception? Will you please describe it?

M.D., Pennsylvania.

ANSWER.—"Stick removal" refers to the use of an ordinary sponge or ring forceps in the evacuation of the uterine cavity. The instrument is carefully inserted in the uterus, opened, rotated 90 degrees or more, closed and withdrawn. This procedure is repeated as many times as necessary to evacuate the gross products of conception. These manipulations may or may not be followed by curettage.

CONVULSIVE STATE IN HIGH SCHOOL GIRL

To the Editor:—A white girl aged 16, born by normal delivery, had rather severe scarlet fever in February 1930. A gland in the left side of the neck became infected and had to be lanced to remove a large amount of pus. The tonsils were removed in April 1930. Some time in her fifth year the first signs of the present trouble were noticed, that is, a rolling upward of the eyes at infrequent intervals, possibly two or three times a month, of seconds' duration. She started to school in September 1931 with the same symptoms, but they became more frequent. Stupors occurred about the eighth year at irregular intervals, i. e. every three to four weeks. They seemed to occur on Sunday mornings in most instances and were noticeable on awakening. The symptoms were eye rolling, pale face and apparent unheedfulness of questions. The attacks usually cleared up abruptly about 2 p. m., after she had rested in bed. They became more severe and of longer duration over a period of two years (between the ages of 8 and 10 years) until the first spasm occurred in the tenth year. The spasms recurred at irregular intervals, six to eighteen months intervening between attacks of that severity. From the tenth to the fifteenth year attacks were noticed in the early morning, sometimes clearing up by 8 to 10 a. m. and sometimes culminating in a spasm which usually occurred in midafternoon. Menstruation began in the twelfth year; it has always been irregular, from two weeks to a few days late, and lasts an average of five days. The patient had no cramps until the present year. During the past eight months five spasms have occurred. Symptoms show up two to three hours after the patient arises instead of immediately after her awakening, as happened before. Disappearance of symptoms is noted after spasm or after a night's rest in instances in which attacks do not culminate in spasm. The dates and incidence of attacks during the last eight months have been two (one week apart) in January, one in February, none in March or April, one in May and none in June or July; the last attack was on August 28. The patient gives a history of having more or less constipation, having a ravenous appetite and being irritable for at least twenty-four hours before spasms. She loses consciousness completely, froths at the mouth and occasionally bites her tongue. Her appetite runs to condiments and rich foods. At the age of 9 years she was taken to a nerve specialist, and her food was prescribed by him. The mother weighed all the patient's food according to prescription but found no noticeable change during this year. On August 31 the basal metabolic rate was reported as -2. I should appreciate possible diagnosis, information on prognosis and treatment and, since the mother contemplates keeping the girl out of high school this year because of the spasms, advice in regard to the girl's going to school.

M.D., Oklahoma.

ANSWER.—The diagnosis is convulsive state due in all probability to an encephalitis produced by scarlet fever in February 1930. The prognosis depends on the ability of an anticonvulsant drug to stop the spasms. The treatment consists in determining the amount of sodium bromide or phenobarbital necessary to stop the spasms. The following regimen is suggested: 22 grains (1.4 Gm.) of sodium bromide three times daily. This is to be continued for years if the patient has no more spells. If, however, she continues to have spasms, the bromide should be increased to an amount which will stop the attacks. If the patient cannot take bromides phenobarbital, in doses of 1½ grains (0.1 Gm.) three times daily or more, may be substituted. Phenytoin sodium has been used of late, and if either the bromides or phenobarbital is not satisfactory phenytoin in doses of 1½ grains three to five times daily may be tried. If this is done, one should have a complete blood count and electrocardiogram made before and during treatment. If the patient continues to have spasms it is obvious that she cannot go to high school unless the school has facilities for such persons. If such a school is not available, private tutoring is in order. Should she have no further spells she can go to high school. She should have eight to nine hours of sleep every night, but she must not drive a car, ride a bicycle, climb heights or swim. The diet should be that of any normal person of her age. Overeating should be discouraged.

FRIGIDITY IN WOMEN

To the Editor:—A woman aged 27, college graduate, with normal health before marriage, has been married nine years. Her oldest child is 7 and youngest 3. There is no history of abortion. The patient has never experienced an orgasm at any time and has no desire for coitus, although the act is not repulsive to her. She had a partial hysterectomy with perineal repair in January 1941. The reason for the operation was menstrual periods lasting from twelve to fourteen days. Her general health has improved since the operation but she still has no desire for coitus. She wants to know if there isn't something she can take to increase her libido. Is there anything you might suggest in this case?

M.D., New Jersey.

ANSWER.—Unfortunately there is no drug that can be safely relied on to increase libido in women. Since the beginning of time preparations have been recommended for this purpose but invariably they have been found to be either dangerous or worthless. In the first class are numerous genitourinary irritants such as yohimbine, phosphides and oleoresins excreted in the urine. Unfortunately, the risk of articles in this class, particularly when administered repeatedly, does not justify their use. In recent years endocrine preparations have been tried but the results have been disappointing. Estrone and its

derivatives are said to increase libido occasionally during the menopause or when there is a definitely known ovarian deficiency of this hormone. The prevailing experience is that endocrine preparations almost invariably fail when they are given to otherwise normal individuals for this purpose. In addition to this there is definite evidence that the continued administration of estrogens may lead to atrophy of the normal ovary. Dry glandular preparations taken orally may be dismissed as worthless.

In the vast majority of instances, frigidity in women is due to one or both of two causes: (a) psychologic or emotional trauma; this may arise from early influences which have associated ideas of shame, disgust or revulsion with the sexual act, or an early unpleasant sexual assault; or (b) conjugal maladjustment.

The determination of the exact nature of the barrier to normal feeling requires painstaking and sympathetic investigation on the part of the physician. A frank discussion is indispensable, and sometimes the services of a psychiatrist should be obtained. It is essential that the problem be frankly discussed with the husband whenever possible; the understanding physician may be able to discover faults in his approach to the relationship and suggest changes in his technic. However, having found the basis for the difficulty, it is not always possible to change the situation. This is particularly true in long standing cases in which the pattern of reaction has become deeply fixed.

SMOKING AND LONGEVITY

To the Editor:—The answer to the question about smoking and peptic ulcer (*Queries and Minor Notes*, July 5, 1941, p. 77) may be summarized, I think, as "the evidence is equivocal." Probably the same answer could be given to the effect of smoking on almost any other condition in which smoking has been thought to play an important role. Am I correct, however, in my view that the evidence for the effect of smoking on longevity (most important "condition" of all) is unequivocal? Has any evidence appeared to modify the life tables set up by Prof. Raymond Pearl or have any valid criticisms been made of his conclusions based on this study? I have been informed that reliable life insurance companies have set up similar tables and formed similar conclusions but for certain reasons have withheld this information. If this is true, and/or if Dr. Pearl's conclusions have not been seriously questioned, it seems strange that more emphasis is not laid on this effect of tobacco smoking and less on its comparatively trivial effects for which the evidence is so equivocal.

M.D., California.

ANSWER:—The problem presented in this inquiry has long been the subject of a certain amount of controversy. It appears that tobacco smoking may affect the cardiovascular system (Hines, E. A., and Roth, Grace M.: *The Effect of Tobacco on the Blood Pressure as Measured by a Standard Smoking Test*, *Proc. Staff Meets., Mayo Clin.* 13:524 [Aug. 17] 1938) and may also play a part in the incidence of certain specific diseases, such as coronary disease (e. g., English, J. P.; Wilkins, F. A., and Berkson, Joseph: *Tobacco and Coronary Disease*, *THE JOURNAL*, Oct. 19, 1940, p. 1327). As far as the effect of tobacco on longevity is concerned, in addition to the work of Pearl referred to in the query the report by H. G. Hadley (*Effect of Tobacco on Longevity*, *J. Med.* 22:24 [March] 1941) perhaps deserves special attention. His study was based on records obtained of eight thousand deaths occurring in insured men and woman smokers and nonsmokers. The number of woman smokers, however, was insufficient to give the results statistical significance. He concludes that in comparing the groups of smokers and nonsmokers among men the results are conclusive and that, from the age of 40, users of tobacco have less mean expectation of life than nonusers. In spite of these apparently significant results, the whole question cannot yet be considered as definitely settled.

"DRY" SPINAL TAP

To the Editor:—Please discuss the significance of a "dry" spinal tap, assuming that the needle has been correctly placed. Can dehydration result in a spinal fluid pressure sufficiently low to result in a "dry" tap? Please mention references to the literature.

M.D., California.

ANSWER:—A "dry" spinal tap is invariably due to faulty technic. In isolated instances there may be a thickening of an exudate in the spinal canal so that it cannot pass through the lumen of the needle. This happens in epidemic, pneumococcal and suppurative leptomeningitides. Occasionally because of a tumor or hydrocephalus there may be an absence of fluid at the lower part of the spinal canal. This difficulty is mechanical. In rare instances a deformity of the vertebra may cause an inability to get spinal fluid through the lumbar route. This

occurs in tuberculosis, rickets, arthritis and spondylitis deformans. If no fluid is obtained under normal circumstances, one should reintroduce the stylet into the needle so as to clear the lumen. If no fluid appears, the needle should be either moved a little deeper or withdrawn or rotated.

Dehydration should not produce a dry tap under normal circumstances. Dr. Abraham Levinson's book *Cerebrospinal Fluid in Health and in Disease* (ed. 3, St. Louis, C. V. Mosby Company, 1929) is suggested for reference.

ALLEGED SPONTANEOUS PERIODIC RECURRENCES OF VACCINIA

To the Editor:—A white woman aged 35 was vaccinated against smallpox at the age of 7 by the usual scratch method used at the time, with a rather severe reaction, both local and systemic, and a large scar resulted. Four years later, at the age of 11, she states, the scar became "raw" and again went through the same stages as the original vaccination. There was again systemic involvement in the form of general malaise and fever. Since that time there have been recurrences of these symptoms at four year intervals. All have included local lesions at the site of vaccination, and some systemic reactions. There is at present a granular area about the size of a silver dollar marking the site of her vaccination. I have never heard or read of such a condition and would appreciate any explanation and suggestions as to treatment and prevention.

J. H. Cordes Jr., Medical Student, Atlanta, Ga.

ANSWER:—Spontaneous periodic recurrences of the local and general reactions of vaccinia as described in the question are not known to occur. It is well known, however, that under certain circumstances revaccination may result in accelerated local and other reactions, but there is no history of revaccination in the present case and it would seem quite safe to assume that contact infections, e. g. with cowpox, could not have occurred. In any case the reactions described are inconsistent with the degree of immunity that would be expected to develop from repeated introduction of cowpox (vaccinia) virus.

The central point to consider in connection with this question is the reliability of the alleged facts on which it is based. The possibility of a fictitious or erroneous account cannot be excluded as long as not a single one of the reported recurrences has been observed and recorded by a physician. Obviously plans should be made for close and competent medical supervision of the patient particularly at the time when the next recurrence is to be expected. Only by careful observation of the patient herself can any explanation be obtained that may lead to rational treatment or prevention.

CREOSOTE BURNS OF HANDS

To the Editor:—I have received an inquiry from the engineering department asking for something to be used on the hands of track laborers and others who handle creosoted ties to prevent creosote burns. I am informed that there is a lotion or a liquid which prevents such burns. Can you give me a formula or the name of such a preparation?

George P. Myers, M.D., Detroit.

ANSWER:—The work of track laborers is so hard that probably no protective barrier of the skin will long remain in place unless frequently applied. These workers should wear heavy gloves, but it is well known both that gloves are short lived and that they are prone to become impregnated with irritating substances. In addition to the tarry acids and other constituents of coal tar, creosote and similar substances, some cross ties are impregnated with zinc chloride as a fire repellent. A simple emollient may be made with hydrous wool fat and sodium bicarbonate, but a superior type is likely to contain zinc oxide, cornstarch, petrolatum and hydrous wool fat.

SEROLOGIC TESTS FOR SYPHILIS

To the Editor:—Are there any logical reasons why a laboratory should frequently report a 4 plus blood Wassermann and negative Kahn reaction on patients who have never had any antisyphilitic therapy? Also what is the relative value of the blood Wassermann, Kahn and Mazzini tests?

M.D., Texas.

ANSWER:—It is unusual to report 4 plus Wassermann and negative Kahn reactions because generally the Kahn is more sensitive than most Wassermann technics. If this type of report is a frequent occurrence, indications are that either the Wassermann or the Kahn test is not performed correctly. As to the relative value of the Wassermann, Kahn and Mazzini tests, it is impossible to judge the dependability of a given Wassermann technic unless the particular technic has been officially evaluated by the Evaluation Committee on Serodiagnostic Tests of the United States Public Health Service. The Mazzini test also has not as yet been evaluated by this committee. Only the Kahn test has been thus evaluated. Hence it is impossible to compare these three tests.

PAIN AND TENDERNESS OF BACK IN "NERVOUS"
PATIENTS

To the Editor:—Can you offer suggestions as to the etiology and treatment of the pain in the middle of the back usually at the angle of the scapula or close to it which is complained of by "nervous" patients so frequently? This symptom is most often presented by women, although occasionally by men, and usually occurs when they are tired or have undergone nervous strain. The painful area is usually a small spot and frequently is tender on pressure. I have been at a loss to make any more definite statement about it than to say that it was due to nervousness, but I should appreciate some more definite information about it.

M. J. Leitner, M.D., Bushkill, Pa.

ANSWER.—The etiology of pain and tenderness in the back, usually between the angles of the scapula in so-called nervous patients, is in all probability postural in type. Such a complaint is much less frequent today than it used to be thirty or forty years ago. In the Victorian era this symptom was apparently common in women, for it is described in detail in the textbooks of that period. One surmises that such pain was analogous to the other neurologic, functional disorders of the time such as frequent fainting and "brain fever," so familiar to the readers of novels. It was a nonathletic age for women and, as sports have become part of the routine of feminine education, symptoms similar to the pain in the back have disappeared. Another factor was probably the type of corset which gave not only an artificial support to the back but also tended to constrict the chest as well as the abdomen.

Although the symptom is comparatively rare at the present time it is not unknown in thin, poorly muscled, nervous persons. There is no physiologic explanation for the localized tenderness other than due to strain on muscles, ligaments and joints, particularly in the neighborhood of the second to fifth thoracic vertebrae. It is not therefore definitely connected with the psychoneurotic but it appears more frequently in psychoneurotic people than in the general run of patients. Postural exercises, improved general health and avoidance of continued strain all tend to relieve the symptom.

SCLEROSING SOLUTIONS AND NEPHRITIS

To the Editor:—Is there any evidence that the materials used in injecting varicose veins cause renal difficulty? In a case I have seen, quinine and urea hydrochloride, as well as sodium morrhuate, were used in the usual amounts at weekly intervals, for a series of about five injections. About a month later the patient had uremia, with a level of nonprotein nitrogen in the blood of 174. The volume of urine was somewhat scanty, although the specific gravity was 1.007. The urine contained occasional red blood cells and red blood cell casts. I believe that chronic nephritis is present and that the injections had nothing to do with the picture.

M.D., California.

ANSWER.—There is no evidence that the sclerosing solutions mentioned cause any renal damage. An ascending thrombus through the vena cava may conceivably block one or both renal veins, but such blocking would be accompanied with massive edema of both lower extremities and of the flanks. Unless it can be shown that renal function was adequate and nitrogenous retention did not exist before the injections were given, there seems to be no basis for connecting the injections with the renal impairment.

INCISION ANTERIOR TO ANUS AND IMPOTENCE

To the Editor:—Will you kindly advise whether an elliptic incision just anterior to the anus for drainage of an abscess of Cowper's gland may account for loss of potency in a 41 year old man.

Harold Levy, M.D., Newburgh, N. Y.

ANSWER.—Loss of potency from such an incision is possible. The terminal branches of the pudendal nerve and sympathetic branches from the pelvic plexuses traverse the two layers of the triangular ligament, where Cowper's glands are located, before supplying the erectile tissues and posterior urethra. These branches may be severed.

Before concluding that the impotence was due to this incision, a fair trial of endocrine medication and psychotherapy should be attempted.

PANTOTHENIC ACID AND PYRIDOXINE HYDROCHLORIDE
FOR ALOPECIA TOTALIS

To the Editor:—A patient with alopecia totalis wrote me recently that she had been advised to use pantothenic acid and pyridoxine hydrochloride. Are these vitamins of any value in the treatment of this disease?

W. J. MacDonald, M.D., Boston.

ANSWER.—Pantothenic acid and pyridoxine hydrochloride are members of the vitamin B complex. Rats and foxes whose fur ordinarily is black become gray and shabby looking when reared on diets deprived of these factors. The color may be restored to normal on addition of the two vitamins to the diet. The exact relationship of each of these vitamins as factors in the

another member of the vitamin B complex, to the prevention or the development of gray hair in animals has not been worked out precisely. They are being administered experimentally to human beings, but the results are not yet available. There is now no reason to expect these vitamins to be of benefit in the treatment of alopecia totalis.

RECURRING STIES

To the Editor:—Can you give me some information regarding recurring sties? I have in mind treating a patient with compresses of sulfapyridine or sulfathiazole. Would this be harmful? M.D., New York.

ANSWER.—Recurring sties are usually due to a staphylococcal infection of the large follicles. They may be often prevented by using 2 per cent yellow oxide ointment or 3 per cent ointment of ammoniated mercury. There is no reason why compresses of 5 per cent sodium sulfathiazole might not be successful in cases which have resisted the other treatment, and a 5 per cent ointment of sodium sulfathiazole might also be tried. Apparently neither the ointment nor the solution is particularly irritating to the conjunctiva and cornea. In addition to the local treatment it is sometimes necessary to increase the patient's general resistance by the use of an autogenous vaccine. Many ophthalmologists also use cod liver oil and viosterol in such cases.

GLOVES USED IN FLUOROSCOPY

To the Editor:—I have been informed that at the Mayo Clinic and at the University of Michigan Hospital the men doing gastrointestinal fluoroscopy are wearing only kid gloves while doing this work. I am wondering whether this is true and, if true, what evidence there is which proves that this is a safe practice. Is this not too dangerous for the fingers of the person doing this work?

R. C. Conybeare, M.D., Berrien Center, Mich.

ANSWER.—It is true that part of the gastrointestinal fluoroscopic work at the Mayo Clinic and at the University of Michigan has been done without lead rubber gloves. This is done only by those especially trained to do palpation under the screen with so restricted a beam of x-light that the hand is outside the direct rays. The practice of using leather gloves or bare hands is not recommended for general use. During the last year workers at the Mayo Clinic have found the flexible lead impregnated gloves made by the Liberty Dressing Company most satisfactory.

ANALGESIA MACHINE

To the Editor:—Recently I heard of a neighboring dentist using some type of analgesia wherein the patient squeezed a bulb and inhaled some material whenever she had pain. She would stop when the pain ceased. In the meanwhile, she was fully conscious and able to converse but still had not the least sensation of pain. Do you have the information at hand as to what the gas is that is used; its practicability; its safety?

Raymond H. McPherron, M.D., Chicago.

ANSWER.—The device referred to is called an analgesia machine and has been used extensively by dentists. It is a small nitrous oxide-oxygen machine fixed with a trigger-like device which allows the gas to run when it is pressed. The patient is given a bulb which is connected by a tube to the machine. When the patient has pain, she squeezes the bulb, the nitrous oxide starts to flow, she inhales it, and as soon as she is relieved of pain and relaxes she no longer squeezes the bulb. There is nothing complicated about the arrangement, and it has even been used for the relief of pain during childbirth. It is considered to be safe.

ODOR OF ICE CUBES IN ELECTRIC REFRIGERATOR

To the Editor:—Some patients have standard electric refrigerators and have noticed intermittently but over considerable periods of time a mildly offensive garlic odor and taste in the ice cubes which is apparently incident to their melting. They themselves have carefully checked the contents of the refrigerator and cannot associate it with any foodstuffs, and they never under any circumstances use garlic or have any onion or similar substances in the refrigerator. If this matter has come to attention elsewhere, will you please advise me as to the possible hazard and method of correcting it?

Edward S. McSweeney, M.D., New York.

ANSWER.—In hot weather, even in the absence of onions or garlic, objectionable odors may be imparted by other foods. Defrosting followed by thorough cleansing with water containing a small amount of baking soda and airing for from two to five hours doubtless will improve the condition. The household refrigerator trade believes that citrus fruits particularly are likely, under certain conditions, to impart flavors to drinking water that may be considered objectionable. If the remedy mentioned is unsuccessful, the service department of the refrigerator purveyor should be asked to investigate.

